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15 & 16 VICTORIÆ, Cap. 83. Sec. XXXII.

CHRONOLOGICAL AND DESCRIPTIVE INDEX

OF

PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING

THE ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

For the Year 1872,

With Indexes of Names and Subject-matter.

Printed and Published by Order of the Commissioners of Patents

UNDER THE

ACT of 15 & 16 VICTORIÆ, Cap. 83. Sec. XXXII.

BY BENNET WOODCROFT,

CLERK TO THE COMMISSIONERS OF PATENTS.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
PUBLISHED AT THE OFFICE OF THE COMMISSIONERS
OF PATENTS FOR INVENTIONS,
SOUTHAMPTON BUILDINGS, HOLBORN.

1873.

PREFACE.

PREVIOUS to the year 1867 the Abridgments of Specifications were published in classes only; and after the publication of the first volume of a class, bringing the Abridgments down to a particular date, considerable time necessarily elapsed before the appearance of the second part or continuation of the class. To obviate the inconvenience thus occasioned, the Commissioners of Patents made the following rule:—

PATENT LAW AMENDMENT ACT, 1852.
15 & 16 VICT. c. 83.

By the Right Honourable Frederic Lord Chelmsford Lord High Chancellor of Great Britain, the Right Honourable John Lord Romilly Master of the Rolls, Sir John Rolt Her Majesty's Attorney General, and John Burgess Karslake Esquire, Her Majesty's Solicitor General, being four of the Commissioners of Patents for Invention under the said Act.

It is ordered as follows:—

After the 31st day of December 1866, every applicant for Letters Patent shall deliver at the Office of the Commissioners, with his provisional specification, or (when a complete specification is filed with the petition and declaration) with his complete specification, an abridgment, in duplicate, under his hand or the hand of his agent, of such provisional or complete specification. The abridgment must set forth the name of the applicant, the title of the invention, and describe, in as short a manner as possible, the features of novelty which constitute the invention. The abridgment and the copy thereof must be written upon sheets of foolscap paper, and upon one side only of each page, leaving a margin of one inch and a half on the left-hand side of the page.

(Signed) CHELMSFORD, C.
ROMILLY, M. R.
JOHN ROLT.
JOHN B. KARSLAKE.

Dated the 17th day of December 1866.

The Commissioners also directed that the Abridgments so delivered should be printed and published in the following manner, as explained in their Report to Parliament for the year 1866:—

"These abridgments will be printed and published in quarterly volumes after the expiration of "the six months' protection. Thus the abridgments delivered at the office in the quarter ending "31st March will be ready for printing in the quarter ending 30th September, and the volume will "be published in the ensuing quarter. The volumes will be of the same size as the chronological, "alphabetical, and subject-matter indexes (imperial 8vo.), and constitute in fact a fourth kind of "index, viz., a descriptive index in a chronological form. It is also intended to publish these "abridgments from time to time in classes, according to the plan which has been in operation from "the year 1856."

The publication of the Descriptive Index accordingly commenced in 1867. In the volumes for the years 1867 and 1868, the correct title of the Invention is prefixed to each Abridgment, and also the name of the communicant, when the invention has been communicated from abroad, and a notice if Letters Patent have not been granted or are void for want of a Final Specification. To the end of the Abridgment is appended the price of the printed copy of the Specification with the word "Drawing," "Drawings," or "No Drawings," as the case may be. The Abridgment itself is printed exactly as furnished by the applicant for Letters Patent; no attempt being made to correct errors in spelling or grammatical construction, or to supply words which have been omitted. It is deemed necessary to give this explanation, to account for the errors which are to be found in the printed Abridgments.

In the volume of this Index for the year 1869, all the information previously furnished in a separate form by the Chronological Index was given (as well as an Alphabetical Index of Names); the title was changed to "Chronological and Descriptive Index of "Patents applied for and Patents granted;" and the Chronological Index ceased to appear as a distinct publication.

In consequence of the receipt of a memorial signed by a large number of patentees, manufacturers, and literary and scientific men, the Commissioners of Patents decided that the Abridgments delivered after the 1st January 1871 should be published weekly (instead of quarterly), with Indexes of Persons and Subjects. The Chronological and Descriptive Index for 1871, with Indexes of Names and Subject-matter, accordingly commenced in a weekly form on the 14th July 1871; and the Alphabetical and Subject-matter Indexes ceased to appear as distinct publications. The notices which were prefixed to the Abridgments in cases where Letters Patent had not been granted or were void for want of a Final Specification have been discontinued, as, on account of the early publication of the Abridgments, the information could not in every case be given; but this information will be found in the copies of the Specifications which are subsequently printed. In the body of the work the Abridgments of the Provisional and Complete Specifications are published in regular numerical order at the expiration of the term of six months from the date of application. But each weekly number has an appendix, containing the Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications just received. These Abridgments are subsequently printed in the body of the work in their proper places, in order to preserve the numerical and chronological arrangement of the book. In the indexes of each successive number all the previous indexes are incorporated until the end of the year; and then the last indexes only are to be retained to bind with the fifty-two weekly parts in one volume for the year. The appendixes are not to be bound with the volume, as the Abridgments which they contain ultimately appear in the body of the work.

B. WOODCROFT.

July, 1873.

CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 1 to January 5, 1872.

A.D. 1872, January 1.—No. 1.

SMITH, John, of Loyland, in the county of York, manager.—"Improved self acting temples used in looms for weaving."

This invention consists in improved arrangements of temples for enabling heavy, medium, and light fabrics to be woven at a uniform width. In one arrangement the patentee places in the temple stock at each side of the loom a series of rollers in line with each other, each roller having in its periphery one, two, or more circles or rows of pointed pins or teeth working in slots or grooves in a frame fixed to the breast beam or loom side; and the cloth or fabric in its passage to the cloth or winding on beam is held firm by the pins and slotted frame, and as the slots prevent the pins from moving inwards and also assist the grip, the cloth or fabric is always of a uniform width.

In another arrangement instead of the rollers the patentee employs an endless chain or chains at each side of the loom, the chains being mounted with pins or teeth working in slots in a stationary frame; and this arrangement also keeps the cloth or fabric at a uniform width during the process of weaving, in consequence of the slots preventing the pins from moving inwards.

A.D. 1872, January 1.—No. 2.

SMITH, Thomas James, of the firm of Robertson, Brooman, and Company, of 166, Fleet Street, in the city of London, patent agents.—(*A communication from Cyprien Marie Tessié du Motay, of Paris, France.*)—"Improvements in the treatment of lyes and wash waters resulting from the preparation of woody and other fibres, filaments, and fabrics."

Resinous, gummy, and ulmic matters are separated and precipitated from alkaline lyes and wash waters by the injection of carbonic acid gas and sulphuret of sodium, of baryum, or of calcium, with or without the addition of hydrate of lime or oxide of iron.

A.D. 1872, January 1.—No. 3.

TOEPLER, Paul, of Gracechurch Street, in the city of London.—"An improved method of treating and cleaning all kinds of animal and vegetable fibrous materials containing grease."

The features of novelty of this invention consist in operating with fusil oil upon raw or manufactured or partly manufactured animal and vegetable fibrous materials containing grease, for the purpose of cleaning the said fibrous materials and separating the grease therefrom.

A.D. 1872, January 1.—No. 4.

HIGHTON, Henry, M.A., of Putney, in the county of Surrey.—"Improvements in electric telegraphs."

This Provisional Specification describes means for submarine and subterranean telegraphy through uninsulated wires.

A.D. 1872, January 1.—No. 5.

SILVESTER, Allen, of Edgware Road, in the county of Middlesex.—(*A communication from Henry Silvester, of Saint Louis, Missouri, in the United States of America.*)—"An improvement in carriage wheels."

This invention has for its object an improvement in carriage wheels, and consists in making the tyres of such wheels with channels or recesses at their inner parts to receive the felloes of the wheels, which are correspondingly formed, the sides or edges of such channels or recesses in the tyres forming flanges or projections by which the felloes are embraced or held and protected.

A.D. 1872, January 1.—No. 6.

FISH, William Stebbins, of No. 166, Buchanan Street, Glasgow, in the county of Lanark, North Britain.—"Improvements in the construction of packing for piston rods, pipe joints, and other similar "purposes."

The feature of novelty which constitutes this invention is the spinning or twisting of the fibers together into continuous lengths in place of the mode of manufacturing asbestos or amianthus packing hitherto adopted.

A.D. 1872, January 1.—No. 7.

FISH, William Stebbins, and **WOTHERSPOON, James**, both of Glasgow, in the county of Lanark, North Britain.—"Improvements in yarns, threads, twines, cordage, or ropes, and in the employment or "application thereof."

The feature of novelty which constitutes this invention is the employment of asbestos or amianthus either combined or not with other fibrous materials, as a substitute for the materials hitherto employed for making yarns, threads, twines, cordage, or ropes.

A.D. 1872, January 1.—No. 8.

TULLIS, John Keil, of Glasgow, in the county of Lanark, North Britain.—"Improvements in punching "holes in leather and other similar materials, and in the machinery or apparatus employed therefor."

This invention relates to the arrangement and construction of mechanism for punching holes in or perforating leather and other similar materials in order to render the same fit for receiving rivets at places where the leather or other similar material is jointed, and it has for its object to effect the said operation more speedily and more economically than hitherto accomplished.

A special object of this invention is to facilitate the manufacture of leather hose by punching the holes in each side of the material at one operation.

A.D. 1872, January 1.—No. 9.

GEOGHEGAN, Stannus, of the city of Dublin, Ireland, brewer.—"Improvements in apparatus for names "marking or consecutive number branding casks, cases, boxes, and other like receptacles."

This invention relates to an expeditious, economical, and effective mode of indelibly marking or numbering with trade mark letters and any number of figures in consecutive order from one to millions at one operation, the ends or heads of casks, sides or tops of cases, boxes, or other receptacles for goods of various kinds.

The apparatus to be employed consists of a square, round, or other shaped open box or frame of cast iron with holes in the side for the admission of cold and the escape of heated air. On the top there is a plate or tray of cast iron made in say four compartments, two (consisting of sunk wells or reserve compartments) being closed underneath, whilst the other two consist of open raised compartments. It is in these latter compartments that the numbers are placed which operate upon the object to be marked or numbered, whilst the other two compartments being lower or sunk the numbers they contain do not come in contact with the wood to be branded or numbered. The higher or numbering compartments in the tray have ledges or parallel V grooves at the bottom to hold the moveable dies or numbers, and the lower or reserve compartments are closed underneath by a plate of iron, so that the dies or numbers they contain slide along the bottom in consecutive order till their turn comes for being introduced by the aid of tongs into the higher or branding compartments. The spaces unoccupied by numbers or letters in the branding compartments are closed up by iron slides or doors which keep all the dies in their places, accommodating themselves to any number, and protecting or shielding the wood from the flame in the unoccupied portions. The whole tray is heated underneath by means of rows of Bunson's gas burners, arranged so that those burners not required to be lighted can be shut off.

A.D. 1872, January 1.—No. 10.

LAKE, William Robert, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London.—(*A communication from William Day, of Newark, New Jersey, United States of America.*)—"Improvements in looms for weaving narrow fabrics."

This invention consists, first, in the arrangement of a shuttle driver provided with two loose slide rods operated separately by balance levers and cam slots, the said loose rods acting upon the shuttle which is carried back and forth by the driver in such a manner that the shuttle is carried through the shed by the alternate action of the slide rods, and receives a positive motion throughout its entire stroke. Second, in the arrangement of a compensator provided with balance weights in combination with a lever pawl acting on a ratchet wheel secured to the take up roller in such a manner that by the said compensator a uniform tension is imparted to each piece of fabric to be taken up, and several different pieces of fabric can be taken up by one and the same take up roller. Third, in the arrangement of a tension weight acting upon the warp as the same is taken from the warp beam in combination with a balance weight which counteracts the tension weight, and is subjected to the action of a cam or equivalent device in such a manner that at the moment the warp is let off it is relieved from the extreme strain of the tension weight, while the said weight is free to exert its full power and so keep the warp at a uniform tension during the whole time the balance weight is acted on by its cam or equivalent device. Fourth, in the arrangement of a series of levers provided with double hooks, which pass through needles provided with double eyes and operated by cams. Fifth, in the arrangement of loose arms, each provided with a cam slot and connected to the bed of the batten by rods, the cam slots being acted on by eccentric wrist-pins projecting from wheels mounted on the driving shaft in such a manner that a free, quick, and easy action is imparted to the batten.

A.D. 1872, January 2.—No. 11.

IRVING, Thomas, of No. 17, Gracechurch Street, in the city of London.—" Improvements in apparatus " for controlling the draught of steam boiler furnaces."

This Provisional Specification describes improvements on the Patent No. 2060/62, and the improvements relate to the fixing of the apparatus to the flue and also to improvements in the apparatus itself.

A.D. 1872, January 2.—No. 12.

DE MONTOISON, Joseph Lambert, of Lille, France, at present of 123, Chancery Lane, London.— " Improvements in means and apparatus for removing the hair or fur from skins, and applying the same to " various useful purposes."

First. After the skins have been wetted I treat their underside with a mixture of chalk and sulphuric acid. The fur or hair is afterwards removed with the greatest ease.

Secondly. The hair or fur so removed may then be applied to the manufacture of imitation furs, rugs, coats, or similar articles in the following manner:—

I coat a material, such as waterproof linen or caoutchouc, with some adhesive mixture, and apply the hair or fur in small portions or tufts to the side so coated, and when the whole is dry I trim or cut the hair so as to obtain an even surface.

Or if it be required to obtain a material for making hats, caps, or similar articles, I separate the fur or hair in a cylindrical case in which revolves a drum on which are arranged a series of strings of catgut or other material, and on these strings the fur or hair is evenly collected; it is afterwards utilized as desired.

A.D. 1872, January 2.—No. 13.

DE MONTOISON, Joseph Lambert, of Lille, France, at present of 123, Chancery Lane, London.— " Improvements in tanning and in apparatus connected therewith."

I arrange any suitable number of pits one after another, at a convenient height from the ground, each pit communicating with the adjoining one by means of openings near the top. In each pit is mounted a revolving axle furnished with arms or paddles, and these axles are connected to a shaft to which motive power is imparted during the tanning process. The skins and liquor are thus kept agitated.

To the matters employed for tanning I apply boiling water and sulphuric acid and place the whole in the first pit, from whence the liquor passes to the other pits, becoming in each successive pit weaker and weaker.

The skins to be tanned are first placed in the end pit containing the weakest liquid, and after remaining therein for a period determined by their size and description, are transferred to the other pits, remaining in each succeeding one for a like period.

A.D. 1872, January 3.—No. 14.

GALLOWAY, George Bell, of West Ferry Road, Millwall, in the county of Middlesex, engineer.— " Improved means for effecting communications between passengers, guards, and drivers of trains, and for " promoting safety and comfort in travelling on railways."

This consists in the use of a valve fixed in connection with a tubular arrangement, so that any passenger may communicate with the guard. Also in cutting the partitions and ends of carriages so as to make a doorway therethrough. Also in means for stopping trains in shorter distances, and in fitting carriages with sleeping and refreshment compartments.

A.D. 1872, January 3.—No. 15.

HUGHES, Hesketh, of Homerton, in the county of Middlesex, engineer.—" Improvements in the manufacture of trimmings, and in apparatus connected therewith."

This relates to embossing lines upon goffered fabrics as a guide for the sewing operation. The fabric is made wavy by pins on plates, which have a reciprocating motion.

A.D. 1872, January 3.—No. 16.

HANDCOCK, Elias Robison, of Albemarle Street, in the city of Westminster, in the county of Middlesex, esqr.—" For certain improvements in mechanism applicable to railway signals."

This invention consists in self acting machinery, which enables the engine driver, stoker, or guard to ascertain the distance and time the previous train has passed the signal post. The indicator being a rod or hand, acting on a semi circular or other form of disc or face on which divisions of time are marked.

A.D. 1872, January 3.—No. 17.

SIEBER, Charles Henry, of Irwell Springs, Bacup, in the county of Lancaster, turkey red and fancy dyer, and **FURNEVALL**, John, of Haslingden, in the same county, engineer.—" Improvements in machinery for dyeing yarns in the hank."

Our invention consists in applying six or other convenient number of winces to a vat containing the dye liquor, and on these winces the hanks of yarn are suspended. Each wince consists of two or more blades, and they are all caused to revolve by a side shaft and gearing. The dye liquor is agitated by a frame worked by an eccentric or otherwise.

A.D. 1872, January 3.—No. 18.

LEBURN, William Gilmour, of the Gateside Mills Company, of Gateside, in the county of Fife, North Britain.—" Improvements in shuttles for weaving, and in apparatus to be used in making the same."

One improvement consists in forming the bottom of the cavity in the shuttle with a series of semicircular inclined ridges by means of a revolving cutter chucked in a lathe, the shuttle being placed in an inclined position on a slide and shifted step by step.

A second improvement consists in fixing buffalo hide on the shoulders of the shuttle instead of iron as hitherto.

A third improvement consists of an appliance to impart tension to the yarn as it issues from the shuttle. A pair of small rollers is applied in front of the eye of the shuttle, being fitted in a recess made in the side of the shuttle, and rubber rings or other suitable springs are applied to the spindles of the rollers, so as to compress or apply frictional resistance to the yarn as it passes out between the rollers.

A.D. 1872, January 3.—No. 19.

LESTER, Henry Edward, junior, of the Victoria Docks, county of Essex, master shipwright.—" Improvements in vessels' steering apparatus."

In suitable framework mounted on an iron or other foundation plate bolted to the deck of the vessel, either aft or amidships, or, if desired, both aft and amidships, I arrange a double chain drum, one chain passing from underneath the drum in one direction to the tiller, the other in the other direction to the tiller. Around the drum is a cogged wheel which takes into two or more small cogged wheels above it. These latter again take into another cogged wheel fixed above them, and on the axle end or ends of this last named wheel the usual steering wheel or wheels is or are fixed.

The size of the last mentioned cogged wheel determines the speed at which the drum is revolved.

If desired a bell on the framework strikes each time the rudder is amidships or perfectly straight.

A.D. 1872, January 3.—No. 20.

MAYLER, Henry, of Liverpool, in the county of Lancaster, cabinet maker.—"Improvements in ships' berths."

These are made of metal. The metal posts are jambed or secured at the required distances apart between the upper side of one deck and the lower side of another deck, and they have bosses affixed to them for the purpose of supporting the side and end frames and the bottoms of the berths.

Each post has, by preference, several bosses secured to it, so that the berths can be formed in tiers.

The posts, frames, and other parts are stowed, when taken down, between the deck beams.

A.D. 1872, January 3.—No. 21.

GIFFARD, Paul, of Rue de la Pépinière, No. 12, at Paris, civil engineer.—"Improvements in compressed " or liquefied air or gas cartridges and fire arms, and in apparatus employed therein."

This invention relates to the construction and use of cartridges containing compressed air or gas or liquefied gas employed for the propulsion of projectiles in weapons specially constructed for the purpose.

It also relates to the construction and use of apparatus for charging and discharging such cartridges, and to the construction and action of weapons by which compressed air or gas contained in a chamber or reservoir is employed for the propulsion of projectiles.

A.D. 1872, January 3.—No. 22.

NOWRICK, Alphonse, and WILD, William Charles, both of Hatton Garden, in the city of London. —"A new or improved method of heightening the color of various gems or precious stones, and of manufacturing artificial gems or stones."

The stone is made in the form of what is technically known as a "doublet," that is to say, of two pieces united together, the surfaces before being united having been coated with a translucid colored varnish, whereby the desired tint is imparted to the stone when naturally pale. We make artificial gems or precious stones of rock crystal in the same manner.

A.D. 1872, January 3.—No. 23.

WHITEHEAD, Henry Walton, of Holbeck, in the parish of Leeds, in the county of York, a partner in the firm of Taylor, Wordsworth and Company, of the same place, machine and tool makers.—"Improvements in machinery for combing wool, cotton, flax, silk, and other fibrous substances."

My improvements consist in an alteration which dispenses with the lids or weights of the feed boxes used in the well known Noble's combing machines or other combing machines that are similarly fed.

A.D. 1872, January 3.—No. 24.

ELMAN, Samuel, and BROWN, Harris Leon, both of Sheffield, in the county of York.—"An apparatus " for cutting or finishing cigars."

This invention relates to a simple and efficient apparatus to be attached to a cigar maker's bench for the purpose of simultaneously finishing or cutting off the end of the cigar and splitting open the severed portion, so as at once to expose and loosen the inside thereof, and admit of its being immediately used in the filling of other cigars, thereby dispensing with the separate hand operations of first cutting off the end, then splitting the leaf, and finally redamping the inside, as by reason of these operations having to be performed after the process of finishing or cutting, the secured ends become in the meantime too dry for use and require to be redamped The apparatus consists essentially of a spring shear, the blades of which are of a concave form on their cutting edge, in order not to flatten the cigar when cutting. To one of these blades there is fitted at a right angle a second cutter, which slits longitudinally the severed portion of the cigar, and to the other blade there is fitted at a right angle a rest or support, for holding the severed portion whilst being slit. The cutters and rest are all made adjustable by means of slots, and the cutting surfaces are maintained apart, when not in action, by a blade or other spring acting upon the jointed arm or arms which carry the cutters. The apparatus is worked by the pressure of the hand upon the upper arm, or by a slight tap or blow imparted thereto.

A.D. 1872, January 3.—No. 25.

HYATT, Thaddeus, of Gloucester Gardens, Hyde Park, in the county of Middlesex.—"Improvements "in fire and burglar proof illuminating roofs, skylights, window lights, and gratings, and in glasses for the "same."

This invention consists in making ribbed or webbed sheets of glass for roofs, and in connecting the several sheets by inverted glass trough shaped beams or caps, so that the roof is composed entirely of glass. The same kind of glass is applied to windows and skylights. The premises covered by these glass roofs are protected from burglars and fire by venetian blind shutters placed below the glass, the laths forming reflecting surfaces, so as not to diminish the light. The separation of the said ribbed plates of glass is facilitated by the shallow grooves for guiding the diamond made therein. The said glass is blue tinted to improve the quality of the light for warehouses. Plates of glass are made with projecting ribs on the under side at suitable distances apart, and either of uniform or gradually increasing depth, which ribs are caused to act as reflecting surfaces. Placing the glasses at an inclination in illuminating gratings, or using glasses with inclined faces, but placed in horizontal seats. Using plates or blocks of alum protected by sheets of glass or varnish as the translucent medium for fire proof roofs.

A.D. 1872, January 4.—No. 26.

BURT, Thomas, of Northampton, in the county of Northampton, civil engineer.—(*A communication from James Burt, of Velsen, in the Kingdom of Holland.*)—"Improvements in that portion of floating dredgers "used in loosening sand, gravel, mud, or other material to be dredged or removed."

The novelty in this case consists in applying to the lower end of the suction-pipe of dredgers a revolving envelope or outer cover, to which are secured, in sockets or recesses formed thereon, a series of projecting instruments for loosening the material to be dredged or operated upon.

A.D. 1872, January 4.—No. 27.

CLARK, Josiah Latimer, of No. 5, Westminster Chambers, Victoria Street, in the city of Westminster. —"Improvements in drain traps."

The object of my invention is so to construct a drain trap that the sewer gases cannot flow back through it into the house connected with the drain. This I do by providing in connection with the trap an escape passage into which the gases pass when their pressure is such as to enable them to overcome the water seal of the trap.

A.D. 1872, January 4.—No. 28.

CASPERSEN, Hans Wilhelm, of Newcastle-on-Tyne.—(*A communication from John Blair, Aarhuus, in the Kingdom of Denmark.*)—"Improvements in high and low pressure or compound steam engines."

This invention has exclusive reference to that class of steam engines known as compound or combined high and low pressure engines, wherein the high pressure steam, after doing duty in a small high pressure cylinder, passes thence to a large low pressure cylinder. According to this invention it is proposed to work high and low pressure or compound steam engines with slide valves or piston valves so arranged as to transmit the steam from the high pressure cylinder to the low pressure cylinder by direct communication with the steam passages or ports at the ends of the two cylinders, thereby ensuring the least possible loss of steam in its continuous expansion from the high pressure cylinder to the low pressure cylinder, whilst at the same time a more effective vacuum is maintained at the return stroke of each piston by reason of the direct communication with the condenser.

A.D. 1872, January 4.—No. 29.

GILMORE, Alfred, of Tandragee, in the county of Armagh, Ireland.—"An improved drag or brake for "the bobbins on spinning frames."

The feature of novelty which constitutes this invention is the employment of a metallic disc having suitable studs and levers and fixed to the "builders" for the purpose of regulating the tension of the thread being wound on to the bobbins, in lieu of employing cords and weights as ordinarily practised.

A.D. 1872, January 4.—No. 30.

ASHCROFT, William, of Wolverhampton, in the county of Stafford.—"An improved construction and "arrangement of buckle or fastener."

The novelty of the invention consists in providing a buckle or clasp for binding articles or connecting strap ends together, the formation of which is obtained by bending a narrow strip or length of metal in such a manner that the over bend is shorter than the under bend, the said under bend being provided with a slot immediately under the termination of the over bend; thus when the strap, cord, or other binding medium is passed through the said slot from the underside, and passed over the edge of the overbend or tongue, the tension or pull of the binding medium causes the upper tongue to yield and bind the strap between the edge of the said tongue and the slot.

A.D. 1872, January 4.—No. 31.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, engineer.—"Improvements in the preparation and laying down of bituminous asphalte for pavement."

The features of novelty are as follows:

1st. Imparting a waxy character to any artificial or natural pitch or asphalte by incorporating with it a non-drying oil or fat.

2nd. Heating thoroughly all the dry earthy powder before mixing it with the bituminous wax.

3rd. Drying and heating the concrete foundation of asphalte paving by means of a furnace arranged thereon, so that the concrete shall form the reverberatory hearth between the furnace and the chimney, whilst the upper side of this arrangement is available for heating the prepared asphalte.

A.D. 1872, January 4.—No. 32.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Thomas Thomson, of Bluff Harbor, Otago, New Zealand, harbour master.*) —"Improvements in anchors."

This invention is designed to make the anchor cant more readily, and to decrease their liability to foul or be thrown out of the ground by the chain. The crown is made with a straight or very nearly straight back, with an arm at each end. On the inner side of each of these arms is a fluke. This crown may be made in two pieces, having a joint in the centre like a rule joint, so that each can fall inward independently of the other, but not outward. The double-fluked crown is made from a flat slab of iron, and may have holes cut in it to lessen its weight. The shank may be described as a double one, or it may be said that there are two shanks, one attached to each end of the stock, converging together so as to form with it a triangle. The two parallel parts are bolted together. The stock to which this double shank is attached consists of a flattened beam having circular extremities to fit into corresponding holes provided for them in each end of the double shank. In the centre of this stock a common shackle is attached, to which the chain is connected.

A.D. 1872, January 4.—No. 33.

LOW, John, of Boston, Massachusetts, United States of America, now of No. 8, Southampton Buildings, London, branch pilot.—"An improved magnetic binnacle for counteracting the effects of local attraction on "ships' compasses."

The object of my invention is the production of a binnacle for iron ships or vessels, whereby the disturbance of the compasses in such vessels by local attraction is effectually counteracted. I construct the binnacle to receive two compasses. Between the two compasses is an adjustable platform whereon I place a magnet, which, when properly adjusted between the compasses, will counteract the local attractions.

A.D. 1872, January 4.—No. 34.

MORTLOCK, Thomas, of Shafton Road, South Hackney, in the county of Middlesex.—"Improved "machinery for dressing and furrowing mill stones."

The features of novelty in this invention consist:

1st. Of a mode of adjusting and holding a diamond cutter.

2nd. A hollow screw for traversing the cutter.

3rdly. Compound speed wheel fixed on the traversing screw.

4thly. Adjustable V slides for the cutter carrier to move along.

5thly. An adjustable pawl to alter speed of the traversing screw.

6thly. A rising and falling steel cutter worked by a lever, the end of which is moved by revolving grooved roller extending across the width of the machine.

7thly. A tie bar, cranked at one end of the machine to allow cutting tool to pass over it.

A.D. 1872, January 4.—No. 35.

HARTLEY, John, of Colne Field, Colne, in the county of Lancaster, shuttle tongue maker.—"Improvements in shuttles employed in looms for weaving."

I form the spring, which is permanently fixed to the tongue or pike at the point or loose end, to extend to and fit into a clip plate, which fits easy around the root or heel end of the tongue, and leaving a small space betwixt to allow the slide movement of the tongue or pike. A V spring or single-lap spring is introduced in a vertical position into the shuttle behind the end of the pike spring.

A.D. 1872, January 4.—No. 36.

DOMINY, George, and RUSSELL, James, of Weymouth, in the county of Dorset.—"Improvements in apparatus for securing window sashes and sliding frames of cases, boxes, or other receptacles."

Sash fasteners can be swung upon a pivot to throw a claw into position for engaging into a fixed claw, a spring acting to keep them in contact and also to draw the sashes together.

A.D. 1872, January 4.—No. 37.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Raymond Marie Jean Baptiste Honoré Henri Barre-Pin, and Jean Baptiste Marie Ernest Barre-Pin, of Paris, France.*)—"Improvements in preserving edible animal and vegetable substances."

The substances to be preserved are placed in cans or jars, together with some suitable hygrometric substance, and the vessels are then hermetically sealed.

A.D. 1872, January 4.—No. 38.

SCOTT, Henry Young Darracott, of Ealing, in the county of Middlesex, Major General, C.B.—"Improvements in the purification of coal gas."

I take quick lime, and having heated it to redness in a suitable conduit or chamber, I pass the gas to be purified over it, and the heated lime will abstract the sulphur or sulphur compounds from the gas.

A.D. 1872, January 4.—No. 39.

WHEATSTONE, Sir Charles, of Park Crescent, Regent's Park, knight, and **STROH, John Matthias Augustus**, of Tolmer's Square, Hampstead Road, both in the county of Middlesex.—"Improvements in musical instruments in which vibrating tongues acted upon by air are employed."

The invention relates to a novel arrangement and combination of parts whereby a single vibrating tongue is rendered capable of producing the notes of one, two, or more octaves, and of producing a "glide" from any one note to any other, of a similar character to that which may be produced on a violin or other similar stringed instrument.

A.D. 1872, January 5.—No. 40.

HYATT, Thaddeus, of Gloucester Gardens, Hyde Park, in the county of Middlesex.—"Improvements in revolving shutters, and in actuating the same."

This invention consists in making wooden revolving shutters fire proof by impregnating the laths with alum, silicate, or other chemical capable of resisting fire. In connecting the bars or laths with interposing india rubber cushions in order that they may coil smoothly.

In protecting wooden revolving shutters against burglars by wires or chains or strong strips of steel passed into the interior. Also in making a sheet revolving shutter like a plain metal curtain, and securing it by pins at its edges, when down. In embossing in relief the fans of these curtain shutters, and "chilling" the raised parts so as to resist attacks of burglars' tools. In making sheet revolving shutters of any size by weaving them of bands or ribbons of metal. In making corrugated metal shutters with various peculiar forms of corrugations, with a view to increase their flexibility and stiffness. In making revolving metal lath shutters with hollow laths, and filling the laths with fire resisting materials. In curving transversely these hollow laths, or the usual solid ones to conform exactly to the arc of that particular part of the coil in which they may be when wound up, in order that the shutter may lie closer and more compact. In the use of pressure or nipping rollers for raising a shutter and pushing it into a "pocket" made to receive it in the wall, or for pushing the shutter onto the coiling drum or barrel.

A.D. 1872, January 5.—No. 41.

GILBEE, William Armand, of the firm of L. de Fontainemoreau & Co., patent agents, 4, South Street, Finsbury, in the county of Middlesex.—(*A communication from James Argall, of Mineral Point, in the county of Iowa, and state of Wisconsin, United States of America.*)—"Improvements in steam water-heaters."

The improved heater consists of a series of concentric cylinders forming alternate water and steam chambers, the latter being open to a steam box at each end; one of the boxes is connected with the exhaust steam pipe of the engine, and the water chambers are supplied with water by a pipe leading from the pump, the outer chamber being also connected by a pipe with the boiler. A deposit box is attached to the lower part of the outer chamber.

An attemperator is employed, consisting of a cylindrical steam chamber placed in the tank; it has a distributing pipe crossing it transversely, and a receiving pipe which is connected with the exhaust pipe of the heater; it is also provided with an escape pipe at its lower part.

A.D. 1872, January 5.—No. 42.

SCOTT, William Middleditch, of the firm of W. and C. Scott and Son, of Birmingham, in the county of Warwick, gun manufacturers.—"Improvements in breech loading small arms."

This invention consists in actuating or withdrawing the spring sliding bolts of drop down guns by means of a vertical axis in the break off, an excentric tooth or projection on the bottom of the axis working in a notch in the side of the bolt. A thumb plate or handle having a side motion on the tang of the gun gives a partial rotation to the axis to cause the tooth or projection to withdraw the bolt. A vertical lever having arms of unequal length may be interposed between the vertical axis and sliding bolt. In this arrangement the long lower arm of the lever works in the bolt, and the short upper end occupies an excentric notch in the axis. By turning aside the thumb plate, the motion of the axis through a small angle produces sufficient motion in the long arm of the lever to give the required range of motion to the bolt to effect its withdrawal.

A.D. 1872, January 5.—No. 43.

SUTCLIFFE, John, of Glasgow, in the county of Lanark, North Britain.—"A new or improved apparatus "for preventing collisions on railways."

The feature of novelty which constitutes this invention is the arrangement of levers and cams whereby a proceeding engine can, by striking a lever, communicate motion through suitable connections, sufficient to close the throttle valve of a following engine and cut off the steam from acting therein.

A.D. 1872, January 5.—No. 44.

HOLDEN, Edward, of the firm of Isaac Holden and Sons, of Bradford, in the county of York.—"Improvements in means or apparatus employed in preparing and combing wool and other fibres."

The invention relates to the employment of teeth of different lengths, fineness, and pitch, a row of longer and coarser teeth working between two rows of teeth shorter, finer, and of a closer pitch or setting. When lashing on to the circle or holding teeth in combing is employed in connection with the improvements, it is preferred that the longer or coarser teeth may be on the side for the drawing off.

When using fine "nacteur" combs, such combs act to form the fine teeth on the drawing off side. The coarser and longer teeth will then work between two finer and shorter rows with finer pitch.

A.D. 1872, January 5.—No. 45.

NEWTON, WILLIAM EDWARD, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Richard March Hoe, of the city of New York, in the United States of America.*)—" Improvements in printing machinery."

The first part of this invention consists in improved ink distributing apparatus, and in improved means of supplying ink to the ink distributing table of typographic and lithographic printing machines, and in the use of glass as a material in the construction of distributing tables.

The second part of this invention consists in an improved mode of operating the sheet flyers of rotary and other printing machines.

The third part of this invention consists in regulating the supply of water to the damping or wetting apparatus of the machine, and in constructing reciprocating tables, capable of receiving two or more stones to be printed from simultaneously.

A.D. 1872, January 5.—No. 46.

NEWTON, ALFRED VINCENT, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Charles Mettam, of the city and state of New York, and John Sexton Sanson, of Morrisania, also in the state of New York, United States of America.*)—" Improvements in lubricators for railway axles."

The first part of the invention consists in a novel construction of lubricator, including a pivotted suspension of the wheel by means of a hanger to the rod or arm, by which it is carried, said rod being also pivotted or hinged, and controlled by a spring.

The invention also consists in a combined pad and wiper of novel construction, for preventing the washing or working of the lubricating material along the axle, beyond the journal and out of the box.

A.D. 1872, January 5.—No. 47.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Madame Klotz, junior, widow, and Eugène Klotz, Vitor Klotz, and Hippolyte Meyer, comprising the firm of Klotz, junior, and Company, of* 13, *Boulevart St. Martin, Paris.*)—" An improvement in neckties."

The improvement consists in the application of a metal, leather, or other guard piece, to the tabs or ends of neck ties, which are secured by a clasp or fastening, whereby to prevent wear of the tabs or ends by frequent insertion in said clasps or fastenings, and also facilitate their introduction.

This guard piece may be used with or without the addition of a stiffening introduced in the tab or end of the tie.

A.D. 1872, January 5.—No. 48.

CAITHNESS, The Right Honorable JAMES, Earl of, of Hill Street, in the county of Middlesex.—" Improvements in cleaning railway rolling stock and in the machinery or apparatus employed therein."

This invention consists in cleaning railway carriages by passing them between and under revolving brushes driven by machinery and supplied with water under pressure from the centre of the brush. Revolving wipers may be used for drying the carrriages after the washing process. The waste water is collected in a filter tank, and after being pumped back to the supply tank is used over again. Provision is made for driving the top and side brushes, either together or separately, and for adjusting their height and distance apart to suit different sizes of carriages.

A.D. 1872, January 5.—No. 49.

PEARSALL, JOHN SPENCER, the younger, of Clapham Common, in the county of Surrey, gentleman.—(*A communication from Howard Devenish Pearsall, civil engineer, at present residing in Bankepore, province of Behar, India.*)—" Improvements in the treatment of certain vegetable fibres, and in the machinery or apparatus employed therein."

This invention consists in passing fibres from plants generally which bear strong fibres (called generally Rheea) between drums with projecting ribs in a special manner, and in special arrangements for the application of providing arrested centrifugal force for cleaning fibres from bark, and for the use of water or water and sand at a high velocity for scouring the fibres, and in a peculiar arrangement of the drum with projecting ribs for treating dried Rheea.

APPENDIX

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Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 1 to July 5, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, January 6.—No. 50.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from William Sellers and George H. Sellers, both of the city and county of Philadelphia, in the state of Pennsylvania, United States of America.*)—"Improvements in the regeneration of heat for "furnaces, and in the apparatus or means to be employed therein."

The essential features of this invention are :—

First. Subjecting both the air and the gas moving to the furnace in continuous currents to a progressively increasing temperature, while the waste products of combustion moving from the furnace to the chimney in a continuous current are subjected to a constantly decreasing temperature from the incoming currents both of air and gas.

Second. The combination of a central chamber, in which the waste products of combustion are received from the furnace, a series of pipes, through which the waste products are passed and over which the incoming air and gas move towards the furnace, and one or more side chambers, into which the waste products are discharged from the pipes on their way to the chimney.

Third. The combination with the air chamber in a heat regenerative apparatus of means for preliminarily treating the air in this chamber to obtain a current on starting.

Fourth. The combination with the opening into the furnace in a heat regenerative apparatus of a gas flue and an air flue, by which flues the air and gas are brought to said opening from opposite directions, so that at said opening they abut against each other, and become thereby thoroughly mixed.

Fifth. A chamber formed by four vertical walls and an arch, the arch resting upon and being connected with two of the walls and interposed between but not connected with the other two walls, to avoid distortion and cracking by expansion and contraction.

Sixth. In a heat regenerative apparatus, the combination with a chamber formed by four vertical walls and an arch, the arch resting upon and being connected with two of the walls and interposed between but not connected with the other two walls, of a sand packing or its equivalent above the arch to prevent leakage of gas.

Seventh. In a heat regenerator apparatus, the combination with a gas valve and gas chamber of a door or its equivalent for admitting air, in order to consume any tar which may deposit on the outside of the series of regenerative pipes.

A.D. 1872, January 6.—No. 52.

BASH, Wolf, BASH, Samuel, and BASH, Gustav, all of Glasgow, in the county of Lanark, North Britain.—"Improvements in bobbins."

The feature of novelty which constitutes this invention is, the construction of the bobbins of rolled paper, pasteboard, or cardboard, formed into tubes by pressure or otherwise, and glued or cemented together.

A.D. 1872, January 8.—No. 59.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from George Sellers, of the city and county of Philadelphia, in the state of Pennsylvania, United States of America.*)—"Improvements in melting furnaces."

The essential features of this invention are:

First. The combination in a melting furnace of two delivery flues, through which flames are introduced opposite each other, so that they will abut against each other in the furnace.

Second. The combination with a regenerative apparatus of a furnace into which gaseous fuel is introduced at opposite points.

Third. The combination in a furnace of a circular or oval shell, an arched crown, and supporting hoops or bands.

Fourth. The combination of an oval or circular casing and an arched crown, which abuts against the roof of the furnace on a plane below the top of the casing.

Fifth. The combination of the charging door and the down take or chimney of a furnace, the two being placed next to each other, so that any cold air which may enter the charging door will be drawn directly into the down take flue in lieu of sweeping through the furnace and exerting a cooling or oxydising influence upon the charge.

A.D. 1872, January 8.—No. 63.

FOTHERGILL, John, of Carshalton, in the county of Surrey, gentleman.—"Improvements in fire irons, " whereby gas can be applied to the kindling of fires."

This invention consists in making a poker or other fire iron tubular with a nozzle at the point, and connecting a flexible gas pipe to the head; gas being passed through it and ignited at the nozzle, the point can be inserted among the fuel in the grate so as to ignite it.

A.D. 1872, January 10.—No. 80.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from William Sellers, of the city and county of Philadelphia, in the state of Pennsylvania, United States of America.*)—"Improvements in discharging or tapping molten metal from furnaces or " crucibles and in casting the same into moulds."

This invention relates to a novel method of discharging the molten metal from the furnace or crucible in which it has been melted, and of casting or transferring the same into moulds or into another furnace or crucible without piercing any part of the hearth or bed of the furnace, or removing the crucible from the furnace in which it has been heated, and without exposing the molten metal during its transit to the action of the air, thereby avoiding the oxidizing effect of the air thereon and preventing the conveyance of air along with the metal into the moulds. In carrying out this invention the transfer of the metal is effected through a pipe or conduit by the agency of atmospheric pressure, one end of the said pipe or conduit dipping down below the surface of the molten metal in the furnace or crucible whilst the other end is in direct communication with the mould, so that on exhausting or partially exhausting the air from the interior of the mould or group of moulds the molten metal will flow freely therein, being forced along the pipe or conduit by the pressure of the atmosphere upon the surface of the metal in the furnace or crucible.

A.D. 1872, January 15.—No. 118.

MADDEN, James, of No. 3, Leadenhall Street, in the city of London.—(*A communication from Theodore Bourne of the city, county, and state of New York, in the United States of America.*)—"Improvements in " cotton gins."

This improved cotton gin consists of a large roller combined with a small roller, also a vibrating plate or stripper, a doctor, and a guard; also a revolving doffer or other equivalent and a guard to shed the seed when the fibres are stripped. The small roller is stayed by rollers or wheels.

A.D. 1872, January 15.—No. 120.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Sophia Letitia Mercer, of Washington, district of Columbia, United States of America, gentlewoman.*)—"An improved reflector for facilitating the threading of needles."

My invention relates to a reflecting shield, made preferably concave, before which the needle is held to be threaded, so that the light concentrated upon the shield shines brightly and clearly through the eye of the needle while the body of the same appears very dark and distinct against the polished surface behind it.

A.D. 1872, July 3.—No. 2014.

PARLOUR, Joseph Thomas, of Rutland Street, Pimlico, in the county of Middlesex, civil engineer.—"Improvements in apparatus to be used in the formation of asphalt and other pavements."

My invention relates to novel apparatus chiefly designed for laying asphalt, concrete, and other similar materials used in the formation of pavements, foundations, and the like. But parts of the said invention are applicable to the formation of pavements and foundations of stone or wood. The said invention consists in the construction and combination of appliances for rolling or otherwise compacting the paving material; in levelling; in raking and sweeping appliances used in combination with the roller or other apparatus; in contrivances for cutting and channelling the pavement, and in apparatus for mixing and spreading the asphalt, concrete, or other material. By the use of my improved apparatus I greatly diminish the cost of laying asphalt and other pavements, and am enabled to construct and repair such pavements in a much shorter time than has heretofore been practicable. I thereby obviate the annoyance and inconvenience occasioned by the lengthened stoppages of the traffic in towns and cities by the present method of constructing these pavements.

A.D. 1872, July 4.—No. 2023.

RICHTER, William, of Eintrachtschütte, Kingdom of Prussia, engenieur.—"An improved machine for breaking bar iron."

The peculiarities of this machine and its advantages over other puddle bar breaking machines are: Frst. This machine will break the millbar in any required part without in the least degree injuring or deforming the same. Second. The said machine stops itself as soon as it has completed its work; that is to say, when the crank-shaft has made one ascending and descending movement it ceases to act. Third. The bent up end of the puddle bar is broken off and taken back from the crank shaft through the crank-pin.

A.D. 1872, July 5.—No. 2034.

ALLEN, Robert Henry, of Palmerston Road, Upton, Essex, commission agent.—"Improvements in the construction and general arrangement of ships passengers' berths for married couples."

For this purpose I arrange the berths in a line with the keel of the vessel and in two rows, one above the other, but I construct them so that while the lower row can be entered from one passage, the upper row is closed and can only be entered from the passage at the other end of the berths. I also insert a partition between each berth, which partition projects about three feet from the end of the same and thus forms a separate chamber for each berth.

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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 5, 1872, and to Appendixes from January 6 to July 5, 1872.

This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. Terms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where also single copies may be obtained at 4*d.* each, except the last number (containing the complete Indexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders to be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commissioners of Patents.

LONDON :
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn.
Friday, July 12, 1872.

CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 6 to January 12, 1872.

A.D. 1872, January 6.—No. 50.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from William Sellers and George H. Sellers, both of the city and county of Philadelphia, in the state of Pennsylvania, United States of America.*)—"Improvements in the regeneration of heat for "furnaces, and in the apparatus or means to be employed therein."

The essential features of this invention are :—

First. Subjecting both the air and the gas moving to the furnace in continuous currents to a progressively increasing temperature, while the waste products of combustion moving from the furnace to the chimney in a continuous current are subjected to a constantly decreasing temperature from the incoming currents both of air and gas.

Second. The combination of a central chamber, in which the waste products of combustion are received from the furnace, a series of pipes, through which the waste products are passed and over which the incoming air and gas move towards the furnace, and one or more side chambers, into which the waste products are discharged from the pipes on their way to the chimney.

Third. The combination with the air chamber in a heat regenerative apparatus of means for preliminarily heating the air in the chamber to obtain a current on starting.

Fourth. The combination with the opening into the furnace in a heat regenerative apparatus of a gas flue and over air flue, by which flues the air and gas are brought to said openings from opposite directions, so that at said opening they abut against each other, and become thereby thoroughly mixed.

Fifth. A chamber formed by four vertical walls and an arch, the arch resting upon and being connected with two of the walls and interposed between but not connected with the other two walls, to avoid distortion and cracking by expansion and contraction.

Sixth. In a heat regenerative apparatus, the combination with a chamber formed by four vertical walls and an arch, the arch resting upon and being connected with two of the walls and interposed between but not connected with the other two walls, of a sand packing or its equivalent above the arch to prevent leakage of gas.

Seventh. In a heat regenerator apparatus, the combination with a gas valve and gas chamber of a door or its equivalent for admitting air, in order to consume any tar which may deposit on the outside of the series of regenerative pipes.

A.D. 1872, January 6.—No. 51.

GARROOD, George William, of Twickenham, in the county of Middlesex, and **HARDMET**, Charles, of Richmond, in the county of Surrey.—"Improvements in apparatus for communicating signals to the "engine drivers or guards of railway trains in motion or to stations in case of accident or otherwise."

According to this invention a series of lever arms mounted on suitable supports are placed on each side of a line of railway. The lever arms are connected together and actuated by means of wire ropes, chains, or other connections, so as to place them in a position across or at right angles to the line, to act upon an arm or projection carried by the engine or guard's van, whereby the bell is caused to ring or other signal given to the driver or guard to indicate danger.

The wire ropes, chains, or other means employed for connecting and actuating the series of lever arms are not formed in continuous lengths, but are arranged according to this invention in such lengths or sections as will admit of their acting with certainty upon a suitable number of the signaling arms or levers; each successive length or section being brought into action by its predecessor for any distance that may be required or as previously determined upon.

At frequent intervals between each signal arm a catch lever or coupling is attached to the chain, rope, or other connection, by means of which a short length thereof can be taken up and retained, the catch lever or coupling being secured by a sliding ring, link, or otherwise; and when it is desired to communicate a signal or signals, the catch lever or coupling is released by simply drawing back the sliding ring or other contrivances for setting a portion of the chain or rope at liberty: the weight at the end of that section will then immediately descend and set the signal arms in a position to give a signal to the approaching engine, and at the same time release the catch lever of the adjoining section, and so on in succession as far as the series of sections are in communication with each other.

An arm (such as previously described) can be connected to the signals now in use, or a single section specially arranged and adapted to indicate danger to the driver may be employed for stopping a train running into a station in foggy weather or otherwise.

A.D. 1872, January 6.—No. 52.

BASH, Wolf, BASH, Samuel, and BASH, Gustav, all of Glasgow, in the county of Lanark, North Britain.—"Improvements in bobbins."

The feature of novelty which constitutes this invention is the construction of the bobbins of rolled paper, pasteboard, or cardboard, formed into tubes by pressure or otherwise, and glued or cemented together.

A.D. 1872, January 6.—No. 53.

HEPWORTH, James, and HEPWORTH, Henry, of Batley Carr, near Dewsbury, in the county of York, woollen spinners and manufacturers.—"Improvements in machinery or apparatus for spinning "woollen yarns."

The improvements consist in the application of a boss of wood or other suitable material constructed to fit on the spindle and rest upon the ordinary collar or bearing for the cop, and of suitable length and form to be a support to and driver of the weft bobbin for spinning weft yarn upon.

A.D. 1872, January 6.—No. 54.

PENNELL, Henry Cholmondeley, of No. 25, Down Street, Picadilly, in the county of Middlesex.—"Improvements in skates."

The features of novelty of this invention consist of:

1st. New heel fastenings for skates.

2nd. New methods of fastening the front part of the boot sole to the skate; and

3rd. New forms for side clamps.

A.D. 1872, January 6.—No. 55.

CUNNINGHAM, William John, of 480, New Oxford Street, in the county of Middlesex, engineer.—"Improvements in means and apparatus for cutting type, and carving, moulding, planing, and ornamenting "wood, ivory, bone, stone, metal, and other materials."

The improvements consist in the employment and arrangement of a travelling table, on which the material to be carved or ornamented is placed, and over which the tools and pointer are arranged to slide up and down.

The table is worked in any direction by means of two or more double-jointed hand levers. To reduce or enlarge a given pattern I use two travelling tables, both worked by one and the same hand lever, which is adjusted to any desired scale.

A.D. 1872, January 6.—No. 56.

SPENCE, Henry Grant, of South Stockton on Tees, in the county of York.—"Improved arrangements "for connecting the various pipes, cocks, and valves to the bottoms and sides of ships or vessels, with the "view to afford greater safety to ships and vessels."

This invention mainly consists in the application of a separate well or box, having only one opening to the sea, closed by one valve, and fixing the whole of the engine and other water connections to it, instead of as in the ordinary way of making a separate opening in the skin of the ship for each cock, valve, or pipe;

but the inventor does not confine himself to the particular shape of valve or mode of working it herein set forth, but reserve the right to apply it in any suitable and convenient manner, working it either from the deck or below or in conjunction.

A peculiar valve and valve rod for working it is described.

A.D. 1872, January 6.—No. 57.

PARKER, THOMAS, of 109, Pilgrim Street, Newcastle-on-Tyne, architect.—" Improvements in heating " apparatus."

This invention consists in arrangements of water pipes conveying hot water to receptacles termed heaters (that is foot warmers, for instance, as in pews in a church), the pipes not radiating heat but conveying it to heaters.

A.D. 1872, January 6.—No. 58.

GILMORE, ARTHUR HAMILTON, of the Junior Carlton Club, Pall Mall, in the county of Middlesex, Commander in the Royal Navy.—" Improvements for preventing noise, breakage, and other inconvenience " arising from bringing jugs, decanters, and other vessels or articles into contact with hard substances."

The applicant constructs the bottom of the vessel or article with an endless groove, into which he fixes india rubber tubing or other similar material, care being taken that the groove shall be so small in comparison with the bulk of the rubber or soft material that when placed therein its pressure will cause it to fit tightly in its place, and the rubber or soft material be allowed to protrude outside the said groove, so that the said rubber or soft material may take the contact with the hard substance on which the vessel or article may be placed. When found necessary, cements, pins, or fastening may be used in order to ensure the rubber or soft material keeping its position in the groove or hollow. Sometimes instead of an endless groove a number of small grooves or hollows are provided, into which the rubber or soft material is fitted in manner before described; and sometimes he encases or partially encases the bottom of the vessel or article with india rubber or soft material.

A.D. 1872, January 8.—No. 59.

JOHNSON, JOHN HENRY, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—*(A communication from George H. Sellers, of the city and county of Philadelphia, in the state of Pennsylvania, United States of America.)*—" Improvements in melting furnaces."

The essential features of this invention are:

First. The combination in a melting furnace of two delivery flues, through which flames are introduced opposite each other, so that they will abut against each other in the furnace.

Second. The combination with a regenerative apparatus of a furnace into which gaseous fuel is introduced at opposite points.

Third. The combination in a furnace of a circular or oval shell, an arched crown, and supporting hoops or bands.

Fourth. The combination of an oval or circular casing and an arched crown, which abuts against the roof of the furnace on a plane below the top of the casing.

Fifth. The combination of the charging door and the down take or chimney of a furnace, the two being placed next to each other, so that any cold air which may enter the charging door will be drawn directly into the down take flue, in lieu of sweeping through the furnace and exerting a cooling or oxydising influence upon the charge.

A.D. 1872, January 8.—No. 60.

LEWIS, GEORGE, of Hassall, near Sandbach, in the county of Chester, farmer and agricultural implement agent.—" Improvements in ploughs."

This invention consists in applying to the rear or hind end of the mouldboards of single and double furrow ploughs and steam and other ploughs a horizontal rotating pulverizer, provided on its under side with vertical teeth or tines. The said pulverizer turns on an axle carried by a strap and draw rod connected to the beam and handles of the plough. The pulverizer is made to rotate as the plough advances by one side of it being pressed in the furrow. By the rotation of the pulverizer in combination with its advancing motion the teeth or tines crush or break up by a cross cutting action the soil behind the mouldboard and also level the soil. A separate implement for breaking up the soil is wholly or in part dispensed with by the use of this invention.

A.D. 1872, January 8.—No. 61.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 35, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from James Leander Cathcart, mechanical engineer, Mosely Ezekiel, attorney at law, and Earnest Francis Maurice Faehtz, contractor, all of the city of Washington, in the district of Columbia, United States of America.*)—“An improved self-releasing hook.”

The subject of this invention is a hook so constructed that it will securely hold any suspended burden so long as the weight rests upon it, but will automatically release and become detached from the same as soon as relieved of its weight.

A.D. 1872, January 8.—No. 62.

MACDONALD, Thomas, and ESKRETT, Cyrus, both of Hull, in the county of York.—“An improved “ relieving apparatus for preventing the sticking of safety valves.”

According to this invention a spiral spring is placed in a cylinder and there secured by a cap at each end thereof. A spindle passes through the cylinder carrying a collar to receive the pressure of the spiral spring; a pipe is attached to the lower end of the cylinder in connection with the hydraulic pump, steam boiler, or accumulator; and the spindle is made to pass through the cover and to enter the pipe in the form of a piston.

The apparatus is placed under the safety valve lever, the upper end of the spindle being provided with a regulating screw which conveys the movement of the spindle to the lever.

A.D. 1872, January 8.—No. 63.

FOTHERGILL, John, of Carshalton, in the county of Surrey, gentleman.—“Improvements in fire irons, “ whereby gas can be applied to the kindling of fires.”

This invention consists in making a poker or other fire iron tubular with a nozzle at the point, and connecting a flexible gas pipe to the head; gas being passed through it and ignited at the nozzle, the point can be inserted among the fuel in the grate so as to ignite it.

A.D. 1872, January 8.—No. 64.

COFFEY, John Ambrose, of No. 3, Bucklersbury, in the city of London, engineer.—“Improvements in the “ manufacture, sublimation, and distillation of sulphur, salts, tar, oil, fats, quicksilver, and other substances “ of a similar nature.”

I place the crude sulphur, salts, tar, or other material in a still, retort, or other suitable vessel, which I encase in an outside jacket in some cases, and in others I either use it or dispense with it and introduce a heated mass into tubes or ducts or any other well known form which will encase the heated material and prevent it unless through conversion to impart its caloric to the material to be operated upon; the heated mobile substance I obtain from a dense paraffin oil or any other such substance or fluid that imparts its heat and maintains its mobility. The form of apparatus I have adopted so far for producing and controlling this heated material is as follows, subject of course to modifications when necessary:—I have a vessel which I term my supply, return, and expansion cistern in which I place the heavy paraffin oil or other such substance or fluid and circulate it by an outlet and inlet (both open, thereby avoiding all pressure from heat) through pipes or ducts to a zig zag worm or other form of pipes or ducts, boiler shape or other form, which I place in a stove, furnace, fusible, or sand bath, the oil passing in at one end and returning heated from the other, which I convey to a pyrometer indicating 1500° Fahrenheit, so that I can accurately know the temperature of the fluid and thereby also regulate the temperature of the mobile substance to the retort or still to the material to be operated upon. The circulation may be maintained by a pump, or the well known principle of the hot water apparatus, by which means I ensure the steady and controllable heat to the substances under operation. It must be understood that I do not confine myself to the above particulars, the apparatus being capable of modifications without deviating from the principle of the invention.

A.D. 1872, January 8.—No. 65.

HILL, James Woodward, of Kimbolton Road, Bedford, civil engineer.—"Improvements in double "furrow ploughs."

The object of one part of the invention is to facilitate the moving of the plough head radially with the leading land and furrow wheels.

The main spindle passes through a hole in the end of the plough beam for steering the wheels and the plough head. The draught chain is attached by an eye bolt or other suitable means to the lower end of this spindle, which at its upper end is formed of a square section to receive a moveable sliding collar, carrying the land wheel axle to facilitate the lifting hereafter referred to.

The steerage bar consists of one long arm and two short ones, called respectively the steerage short arm and lifting short arm. The steerage short arm is connected to the long arm by a joint which allows the long arm to be raised or lowered, while the short steerage arm can only be moved in a horizontal direction on the main spindle. The short steerage arm is formed in one piece with the plough head.

By these means the head of the plough, with its attachments, and the leading wheels move radially together by one movement of the steerage bar.

By another part of the improvements the steerage bar acts as a lever for lifting and lowering the land wheel.

For this purpose the lifting short arm is welded on to the long arm, the joint before mentioned serving as a fulcrum for the lift, the lifting short arm raising or lowering the sliding collar as the long arm of the steerage bar is lowered or raised. The steerage bar is secured in the various positions required by two sets of adjustable horizontal notched guide bars attached to the plough stilts.

By this combination one bar or lever serves both as the steering and lifting means.

A.D. 1872, January 8.—No. 66.

BESWICK, James, of Stockport, in the county of Chester, commercial traveller, and **POTTS, Thomas**, of the same place, estate agent.—"Improvements in apparatus for tilting barrels or casks."

This invention consists in the use of a weighted lever bearing against the under side of the barrel or cask and constituting a self acting tilt.

A.D. 1872, January 9.—No. 67.

PIEPER, Carl, of Dresden, Saxony, now of No. 8, Southampton Buildings, London, civil engineer.—"Improved towing, hauling and hoisting machinery."

The said invention relates to machinery to be used in connection with a wire rope for towing boats, and for hauling and hoisting purposes, and is chiefly designed to form an efficient substitute for the apparatus commonly known as the "clip-drum." When used for towing boats, the said apparatus consists of drums or pulleys, polygonal on the periphery, and arranged in pairs to work upon the wire rope and grip the same between them. One drum of each pair should have adjustable bearings and springs. I arrange a number or series of these pairs of drums upon the boat, and pass the wire rope between all of the pairs of drums. The said drums are all connected to and operated by a steam engine. I may arrange the said drums in a straight or curved line. Instead of arranging the drums to gripe the rope between them, I sometimes use a pair of endless chains with wedge-shaped blocks which gripe the rope tightly between them. At the back of the chains I place guides, either straight or curved.

A.D. 1872, January 9.—No. 68.

COLLINSON, Henry Wier, of 69, The Grove, Hammersmith, in the county of Middlesex.—"A "foundation, grease-proof band, or head-lining for the bodies of hats, caps, bonnets, or other coverings "for the head, whether of silk, straw, felt, or any other material."

The foundation, grease proof band, or head lining of hats made of this material would be perfectly impervious to oil or perspiration, and from the nature of the material used would be more tough, elastic, and durable than those made by the process heretofore in use.

A.D. 1872, January 9.—No. 69.

SAMAIN, Pierre, of Blois, departement de Loir et Cher, France, civil engineer.—"Improvements in breech "loading fire arms."

These improvements consist:

1stly. In an arrangement of helicoidal grooves made in the bolt, and in which engages a projection of the cock in order to cock the gun by the rotary movements of the bolt which causes the cock to pass above the stop of the sear or tumbler.

2ndly. In the construction of the tumbler, which acts by means of a catch on a spring piece and permits of lowering the stop retaining the cock.

3rdly. In an arrangement of extractors consisting of a toothed spring passing over the back wad of the cartridge. This spring is inserted in the notch of the bolt and turns with it round or with a cartridge having a conical shoulder. This cartridge being withdrawn butts against a moveable driver which throws it out of the arm.

4thly. In a stop notch consisting of a spring knob piece, susceptible at option of taking into an opening made in the bolt to prevent its motion.

A.D. 1872, January 9.—No. 70.

CLARK, Edwin, of Westminster Chambers, Victoria Street, in the city of Westminster, civil engineer.—"Improvements in hydraulic lift apparatus for dry-docking vessels."

This invention is an improvement on the hydraulic lift for which Letters Patent were obtained by the present patentee bearing date the 19th January 1857, No. 159.

It is now proposed to arrange the apparatus so as to render the cost of the pontoon unnecessary, and also to provide an efficient means for sustaining the ship, when raised, in an elevated position.

A.D. 1872, January 9.—No. 71.

CARLILE, Wilson, of Walbrook House, London, in the county of Middlesex, plush importer.—"Improve- "ments in mourning hat bands and other similar articles."

The formation of cylinders of felt, cloth, or felted cloth in certain lengths, which are then cut up into the necessary bands or strips of any required depth, being without any apparent join, and applicable for hats, muffs, cuffs, and other articles.

A.D. 1872, January 9.—No. 72.

VALE, Henry, of Birmingham, in the county of Warwick, manufacturer.—"Improvements in the manu- "facture of the frames of eye protectors."

This invention consists in manufacturing the eye protector frame and its joint from one piece of sheet metal, so as to supersede the ordinary soldering and produce a neat and strong eye protector frame.

A blank is first cut from sheet metal, the said blank having at its ends the ears or pieces for the joint. The edges of the blank are then raised nearly at right angles and the middle part pierced or cut from the blank, so as to leave a trough shaped beading or frame having joint pieces at its ends. The wire gauze is fixed in the trough frame by closing the sides of the trough upon the edge of the wire gauze. The joint pieces having been fashioned into eyes or knuckles, the frame is bent into the elliptical figure of the eye protector frame, and completed by jointing its unconnected ends by passing a pin through the engaged eyes or knuckles of the joint.

A.D. 1872, January 9.—No. 73.

EDWARDS, Ernest, of Lincoln Terrace, Willesden Lane, in the county of Middlesex, photographer.—"Improvements in apparatus for photo-mechanical printing, parts of which apparatus are also applicable to "other purposes."

This invention consists of making enamelled paper for printing pictures upon by the addition of resins, oily substances, and chrome alum to the "enamel" composition, and in applying presses driven by steam or other power to the purpose of printing pictures, from the surface of gelatine films, upon such enamelled paper or upon other paper, by applying sets of rollers to ink the gelatinous film, and by applying other sets of rollers having porous coverings kept wet for the purpose of damping the gelatinous films; also in keeping the gelatinous films damp by adding deliquescent salts to the liquid used for the purpose. Also of preparing substitutes for such gelatinous films for printing by forming them of a hard gum or resin dissolved in water by the addition of phosphate of soda or ammonia and albumen or gelatine. Also of making additional designs or letters upon such printing films by adding such designs with a solution of alum or other suitable substance to produce insolubility of the film in the parts so treated; and of printing clouds or other indistinct designs upon such films (for the purpose of obtaining pictures from them) by printing them by means of light upon the back instead of upon the front of the films.

A.D. 1872, January 10.—No. 74.

FOVEAUX, Henry Joseph Francis Hubert, of No. 62, Strand, in the county of Middlesex, surgical instrument maker.—"Improvements in scissors."

This invention consists mainly in the combination of a pair of scissors with a spring-forceps, in such a manner as to obtain great power and facility of turning and guiding the instrument in every direction, while cutting either with the right or the left hand.

A.D. 1872, January 10.—No. 75.

HARPER, Thomas Henry, of Webheath, near Redditch, in the county of Worcester, needle-maker.—"Improvements in receptacles for needles."

This invention relates to the construction of a receptacle for needles consisting of a small case, tray, or basket fitted with a cushion, and with spaces at the ends for the reception of packets of needles.

A.D. 1872, January 10.—No. 76.

DE NEGRI, Constantine, of the Hornsey Iron Works, Hornsey Road, in the parish of Islington, London, in the county of Middlesex.—"Improvements in machinery for the manufacture of paper pulp."

The features of novelty of my invention consist, firstly, in the uniformity of the pulp produced; secondly, that the machine being once set, no attention is required except keeping the hopper full; and thirdly, in the large quantity produced for the driving power and size of machine.

A.D. 1872, January 10.—No. 77.

HARRISON, Thomas, of Burton Road, in the city of Lincoln, agricultural implement and machine maker.—"Improvements in the construction and production of drills or distributors for manure, and also "for distributing seeds."

These improvements avoid the necessity of having a box bottom, as in ordinary drills. The drills are so constructed and produced as to feed on or near the top or centre of the roller or manure-distributing barrel. The roller or distributing barrel is always exposed to sight, and is accessible at any time to the man in charge; the said roller or distributing barrel forming the bottom or lower part of the box.

A.D. 1872, January 10.—No. 78.

HILDESHEIM, John, of Glasgow, in the county of Lanark, North Britain.—"A new method of "separating salt from the ice of sea water, and obtaining fresh water therefrom."

The feature of novelty which constitutes this invention is the subjecting of the blocks of ice to pressure in a suitable press, which has the effect of extruding the salt and leaving the ice pure, from which fresh water may be obtained by melting the ice.

A.D. 1872, January 10.—No. 79.

MONTGOMERIE, John Cuninghame, of Lessnessoch, in the county of Ayr, North Britain.—"Improvements in heating blast for blast furnaces, and in generating steam, and in the means or apparatus "employed therefor."

The feature of novelty which constitutes this invention is the covering of the furnace throat with a dome shaped casing having branches at its sides leading to boilers having spiral tubes, the dome having also a set of winding pipes terminating at one end with the blast engine and at the other with the blast main connected with the twyers, the blast thus becoming heated in its passage.

A.D. 1872, January 10.—No. 80.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from William Sellers, of the city and county of Philadelphia, in the state of Pennsylvania, United States of America.*)—" Improvements in discharging or tapping molten metal from furnaces or " crucibles, and in casting the same into moulds."

This invention relates to a novel method of discharging the molten metal from the furnace or crucible in which it has been melted, and of casting or transferring the same into moulds or into another furnace or crucible without piercing any part of the hearth or bed of the furnace, or removing the crucible from the furnace in which it has been heated, and without exposing the molten metal during its transit to the action of the air, thereby avoiding the oxidizing effect of the air thereon and preventing the conveyance of air along with the metal into the moulds. In carrying out this invention the transfer of the metal is effected through a pipe or conduit by the agency of atmospheric pressure, one end of the said pipe or conduit dipping down below the surface of the molten metal in the furnace or crucible whilst the other end is in direct communication with the mould, so that on exhausting or partially exhausting the air from the interior of the mould or group of moulds the molten metal will flow freely therein, being forced along the pipe or conduit by the pressure of the atmosphere upon the surface of the metal in the furnace or crucible.

A.D. 1872, January 10.—No. 81.

HARLING, Ernest John, of Westbourne Road, Barnsbury, in the county of Middlesex.—" Improvements in telegraphic apparatus."

This invention consists in employing, instead of the magnetic needle ordinarily used in telegraphic apparatus, a soft iron ball, either solid or hollow, or a soft iron ring; such ball or ring having a vertical or horizontal diaphragm of brass or other insulating substance placed therein. The ball or ring is placed between the arms of a permanent horse-shoe magnet.

A.D. 1872, January 10.—No. 82.

BRANDON, Alexander Horace, of 13, Rue Gaillon, Paris, France, civil engineer.—(*A communication from Leopold Lopez de Gonzalo and Silvin Grisei, both of Sanpierdarena, Italy.*)—" The treatment and " application of the tipha latifolia for upholstery purposes, and more particularly for making floating " mattresses."

For this purpose the flowers are detached from the rest of the plant, and they are submitted to a certain amount of heat or to a fumigation of sulphur vapours for the purpose of completely expelling all moisture from the same, as well as for destroying all insects and their eggs therein contained.

The material is then used in the manufacture of mattresses and for other purposes.

A.D. 1872, January 10.—No. 83.

HUNT, Bristow, of No. 1, Serle Street, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from Gerard Sickels and John Hill Thorndike, of Boston, Massachusetts, in the United States of America.*)—" Improvements in meters for measuring water or other fluids."

This invention relates to that class of meters for measuring water or other fluids in which a reciprocating motion is given to the pistons forming component parts thereof.

The invention consists essentially in so constructing and arranging the component parts of the meter, that when water or other fluid is introduced into a horizontal cylindrical piston, it propels it forward in such a manner as to cause a second piston placed at right angles thereto to partially revolve, thus opening and closing ports formed in the said pistons, and so introducing the pressure alternately on the opposite ends of the first piston; by which means a continuous reciprocating and rocking motion is imparted to the pistons, which, by means of an index shaft or arm in connection therewith and with a register, accurately records the amount of water or other fluid passing through the meter.

In one modification of the invention the pistons are superposed and connected by a ball and socket arrangement.

According to a second modification one piston acts transversely within the other.

A.D. 1872, January 10.—No. 84.

BARKER, Charles Mathew, of 12, Kennington Park Road, in the county of Surrey, engineer.—"Improvements in propelling ships or vessels, and in the propellers to be employed therein."

According to this system of propulsion two separate and distinct parallel currents are produced one within the other, the inner or central current being caused by the flow of water into the propeller, whilst the outer or annular current is carried by the expulsion of the water from between an outer casing and the body of the propeller, both currents being caused to flow in the direction of the axial centre line of the ship or vessel.

A.D. 1872, January 11.—No. 85.

HEALEY, Brierley Denham, of Swansea, in the county of Glamorgan, civil engineer.—"Improvements in the manufacture of malleable iron and steel, and in furnaces and apparatus therefor."

This invention has special reference to the process generally known as the "open hearth" or "ore process." The applicant states he is aware that there are patents bearing upon the production of such mixed metals, especially that granted to Josiah Marshall Heath in the year 1845, those granted to Charles William Siemens in the years 1867 and 1871 respectively, and that granted to Thomas Callander Hinde in the year 1870, and considers the improvements described to be applicable partly or wholly to any of the said methods or patents. The various operations which are carried on in succession in the process before-named require the several parts of the apparatus to be so placed with reference to each other and of such construction as will ensure expeditious working, while at the same time the apparatus works with safety and certainty; and with a view to effect this object he applies in several ways hydrostatic power for the purpose of lifting minerals, iron ingots, moulds, and ladles, and debris or cinder, and groups the apparatus in such a way that the molten metal is not exposed to unnecessary radiation, and that the heated ore may fall into a chamber very convenient to the steel furnace, whereby there is a great saving of labour and more work can be done in a given time than is done according to the present method of working the said process.

He also describes improvements in regenerative gas furnaces when such furnaces are used, and several mechanical details.

A.D. 1872, January 11.—No. 86.

ROBSON, Alexander, of Lude, Blair Athole, in the county of Perth, North Britain.—"Improvements in straining the wires of wire fences, and in apparatus employed therefor, the same being applicable to straining telegraph wires."

The feature of novelty which constitutes this invention is the arrangement and construction of apparatus consisting of a rectangular frame, through holes in one end of which a roller works by means of a lever applied to its outer end; one end of the wire being passed through a hole in the roller, it is stretched by depressing the lever, and the second wire is wound round the other to effect a firm junction.

A.D. 1872, January 11.—No. 87.

GOWANS, James, of Edinburgh, in the county of Mid Lothian, North Britain.—"An improved cesspool for preventing the escape of sewer gases into houses or other buildings."

The feature of novelty which constitutes this invention is, the making of the cesspools or pipe between the receptacle and soil pipe double, and from the upper bend of the cespool pipe an air pipe is led into an air duct leading to the roof; through which air pipe the foul gases escape, instead of entering the houses through the soil receptacle or pan of the water closet as at present.

A.D. 1872, January 11.—No. 88.

HODGART, John, of Millikenpark, in the county of Renfrew, North Britain.—(*Partly a communication from Charles Jones, of Bombay, in the Empire of British India.*)—" Improvements in presses for compressing " cotton and other similar substances into bales."

The feature of novelty which constitutes this invention is the forming of the top member of the press in the form of a hollow box, having above it a hopper into which the fibrous substance is placed and from which it is fed into the well of the press, which in this way is enabled to receive a greater amount of material before the compressing action is brought to bear upon it.

A.D. 1872, January 11.—No. 89.

RONALD, Basil, brassfounder, and **FARMER, John**, engineer, both of the city of Glasgow, in the county of Lanark, North Britain.—" Improvements in water-closets and their valves, which are applicable " to other purposes."

This invention consists all as follows: in forming the discharge pipe and its valve close to and in a line with one side of the basin (and by preference having their axes both in the same vertical plane), so that either the axis of the basin or that of the discharge pipe and plug valve may be placed vertically, and connected at their lower end, so that the basin discharges its contents and flushing water direct into the throat of the discharge pipe, fitted with a brass or india rubber seat, closed and opened by the lower end of the valve, with a round or polygonal india rubber bearing ring sprung on to it, so that the plug is pulled up as usual by hand and a rod passed up through the seat or close covers and stuffing box on the discharge chamber, or by a lever or detent on the back of the hinged lid or cover of the basin and seat in closing it, having a pane of glass fixed into the lid to show the handle of the discharge and stop valve and the action of the water in flushing the closet; the cover or seat having an india rubber ring secured tightly to the basin.

The float and its lever and water valve may be of any of the ordinary constructions and work in a small water float vessel, either open on the top or closed by a cover, connected below by a branch to the side of the discharge valve pipe, so that the water rises and falls through to the same level as it is in the basin and discharge pipe, the rod of the float working out through a stuffing box in the close cover of the ball or other float vessel. When all the vessels are thus closely covered in, a conducting pipe leads any smell or effluvia, from the top of the basin, float valve, and discharge pipe, up a vertical pipe through the roof of the house, or into a chimney, or other ventilating shaft.

Another improvement consists in forming an intermediate discharge chamber or trap below the throat of the basin, having its throat valve opening downwards direct into the lower discharge pipe leading to the drain, the upper and lower valves being so connected by a rigid or duplex movable connecting rod, that when the discharge and stopping handle is raised it shuts the lower valve and opens the upper one, so that the contents of the basin are flushed into the said intermediate chamber, and when the handle is lowered the top valve is closed and the lower one opened, which allows the contents to escape into the discharge and drain pipe with the minimum quantity of water necessary, measured by the float and the size and compactness of the intermediate or other vessels, all as described.

A.D. 1872, January 11.—No. 90.

KENT, George, of Buckland, in the county of Hants.—" An improved arrangement of smoke consuming " apparatus."

The features of novelty in this invention consist in an improved method of introducing heated air into the combustion chambers of tubular and multitubular boilers, which it is proposed to effect by passing air tubes through the boiler tubes, so that the air shall become superheated, and mixing with the smoke and gases given off by the fuel, shall effect consumption of the smoke..

A.D. 1872, January 11.—No. 91.

PRICE, George, of 425, Brixton Road, in the county of Surrey.—"Improvements in muffs or finger "protectors."

This Provisional Specification describes a muff or finger protector to be used when pushing a perambulator.

A.D. 1872, January 11.—No. 92.

SCHEMIOTH, Casimir, of Odessa, in the Empire of Russia, but now residing at No. 14, Finsbury Place South, in the county of Middlesex, civil engineer.—"Improvements in the valve gear of steam engines."

The object of the improvements is to obtain a very rapid movement to the slide valve, but without disconnecting the valve from its eccentric.

In carrying out these improvements, between the end of the slide valve rod and the eccentric bar or rod there is interposed a third organ in the form of an extra link or crank capable of turning freely round its centre of motion. The result of the use of this organ or link is, that during the time the centre of the eccentric is making one part of its revolution the valve remains at rest at the end of the stroke, the extra link during the time simply making a partial rotation; during another partial rotation of the centre of the eccentric by the extra link remaining at rest the valve is moved and makes its whole stroke either inwards or the return, as the case may be. During the motion of the eccentric for a third portion of its rotation the extra link completes its rotation and the valve again remains at rest at the other end of its stroke; then during the remaining part of the run of the centre of the eccentric, by the extra link remaining at rest, the valve again moves and makes its outward or opposite stroke as the case may be.

So that instead of the valve moving during the whole turn of the eccentric shaft, it moves only during parts of the whole revolution of the eccentric and with much greater speed at those times.

Instead of employing an extra link or crank as explained, other combustions may be used for the same purpose, as, for instance, a second eccentric acted upon by the end of the main eccentric bar or rod, and acting on the slide valve bar or rod.

The radius of the main eccentric must be made larger by the whole length of the extra link or crank to preserve the same throw or throws of valve.

A.D. 1872, January 11.—No. 93.

SCHEMIOTH, Casimir, of Odessa, in the Empire of Russia, but now residing at No. 14, Finsbury Place South, in the county of Middlesex, civil engineer.—"Improvements in wheels for traction and other similar "engines."

The object of the invention is to obtain greater holding power to the outer surface or tyre of such wheels, with increased durability in their use.

In carrying out one part of the improvements the tyre is formed of a ┳ shape, or with a projecting flange or flanges or a groove or grooves on the opposite sides of it, and the outer part of the wheel itself is formed with recesses or grooves or flanges adapted to receive such projecting parts on the tyre and admit of such tyre having a movement inwards.

The action of such a wheel will be that when the weight comes upon the tyre that part of it next the bearing surface will be flattened, thereby compressing the elastic material, which will recover its proper shape on being relieved from pressure.

The tyre is also, according to another part of the improvements, formed of segments of alternate hard and elastic substances.

The elastic segments being composed of india rubber or compounds thereof, or other suitable elastic material, or of combinations of metallic springs. For the segments of harder material, wood or metal or combinations of wood and metal may be employed.

These several segments may be arranged radially or inclined to radial lines, the object being to present their respective edges to the bearing surface, and they may be held together by dovetail or such like joints between them, or by links or chains.

Also the improvements relate to forming the tyre or parts thereof of alternate plates or sections of metal and wood or other comparatively soft material, with their respective edges or ends to the bearing surface, by which in use the wood or such like material will always be somewhat more worn than the metal, and a corrugated surface will be insured.

This alternation or succession may be formed, if desired, in the direction of the width or thickness of the bearing surface of the wheel.

The object of this part of the invention is to obtain a rough serrated or corrugated surface for the bearing surface of the tyres of such wheels, by the combined use of iron or steel with wood or other comparatively soft and also, if desired, elastic material, arranged alternately or in such order as may be desired.

These combined plates may be held in position by screw or other bolts, rivets, clamps, or by dovetail or other form given to them respectively, or by other suitable means.

A.D. 1872, January 11.—No. 94.

SCHEMIOTH, Casimir, of Odessa, in the Empire of Russia, but now residing at No. 14, Finsbury Place South, in the county of Middlesex, civil engineer.—" Improvements in steam boiler and other furnaces, " and in parts applicable thereto to facilitate the combustion of straw or other light matters as fuel."

The invention relates to the employment of compressing surfaces to act on the fuel to compress it as it passes to the mouth of the furnace, and the acting on such matters by jets of atmospheric air conducted through channels within the mouth of the furnace.

A.D. 1872, January 11.—No. 95.

BUDENBERG, Arnold, of the firm of Schäffer and Budenberg, of the city of Manchester.—(*A communication from Bernhard August Schäffer and Christian Frederick Budenberg, of Buckau-Magdeburg, in the Kingdom of Prussia.*)—" Improvements in liquid meters."

The features of novelty in this invention consist of a cylindrical casing, in which is mounted a light metallic cylinder, having upon its periphery a series of screw plates placed at a distance apart, in order to allow conducting plates formed on the interior of the casing to project between them. The liquid to be measured runs through this casing, and in passing communicates a revolving motion to the cylinder in exact proportion to the velocity of the liquid, the quantity of which, by means of a counting mechanism geared to the cylinder, is measured to the greatest nicety.

A.D. 1872, January 11.—No. 96.

MORTON, Frederick George, of No. 16, Lynton Street, Bermondsey, in the county of Surrey, engineer.—" Improvements in machinery or apparatus for feeding and holding paper or other materials to " be operated upon by brushes or other apparatus for colouring or otherwise treating such materials."

This invention relates to machinery or apparatus for feeding and holding paper or other materials to be operated upon by brushes or other apparatus for coloring or otherwise treating such materials, and has reference to the application of a vacuum or partial vacuum for holding the materials while they are being fed to and operated upon by the brushes or other apparatus by which such materials are to be colored or otherwise treated. For this purpose, according to this invention, a number of cells or chambers are arranged around or about or in connexion with another chamber or cylinder, in which a vacuum is formed and maintained by an air pump or otherwise. The paper or other material to be operated upon is conducted by suitable travelling bands to a wire web or perforated band travelling with and over or opposite to apertures or openings formed in the covers or outer sides of the small cells or chambers, from which the air is then exhausted through suitable openings, passages, or ways into the larger chamber or cylinder, thereby forming a vacuum in the small cells or chambers, so that the excess of pressure on the opposite surface of the paper or other material under treatment holds it in position over the perforations above referred to.

A.D. 1872, January 11.—No. 97.

WAYGOOD, Richard, of the Newington Iron Works, Falmouth Road, in the county of Surrey, engineer. —" Improved means of subduing or extinguishing fire, and in apparatus connected therewith."

This relates chiefly to the employment of carbonic acid or other equivalent gas in combination with steam for subduing flame, the gas being generated in the furnace and the steam in the boiler of, say, a steam fire engine, by heat derived from a chemical agent in contact with ordinary fuel placed in the furnace and ignited.

The combined gas and steam is to be ejected upon or against material in flame for the purpose of subduing or extinguishing the same.

A.D. 1872, January 12.—No. 98.

SCHLESINGER, Augustus Arnold, of Finsbury Street, in the county of Middlesex.—(*A communication from Joseph Dixon, of New York, United States of America.*)—"A new or improved combined tool or "household implement."

This invention consists of a combined tool, fulfilling ten purposes or more, such as a hammer, nail or tack drawer, pincers, wrench, screw driver, carpet-stretcher, crow-bar, box opener, cork-presser, gas pipe wrench, or otherwise.

Two lever handles are made so that one passes through an aperture in the other to form a fulcrum, and the various tools are constructed jointly or separately as required on the levers.

A.D. 1872, January 12.—No. 99.

ANDREWS, William Ward, of the Kingsland Road, in the county of Middlesex, general manager of the Gas Meter Company, Limited.—"Improvements in wet gas meters."

The improvements relate to means by which to regulate the supply of gas to compensating wet gas meters.

In place of the valve or cover to the inlet passage being formed on or affixed to the float, it is formed separate from it, and is acted upon for its closing by a part of or a projection from the float.

A ball or rolling surface capable of rolling in a passage or chamber slightly inclined to the front is also applied, so that in the event of the meter being tilted forward by accident or otherwise, such ball or rolling surface will act to close the valve and stop the supply of gas.

In the event of the valve sticking, a part of or a projection from the float acts on a part of or a projection from the valve to release it.

A.D. 1872, January 12.—No. 100.

SELLARS, John Carrington, of Birkenhead, in the county of Chester, manufacturing chemist.—"Im- "provements in artificial fuel."

This consists in adding to peat charcoal, wood charcoal, coal or coke dust or powder, as an agglutinating or binding agent, sea ware or the liquor thereof, and after thoroughly mixing the mass, moulding it by hand or machinery into lumps or bricks suitable as fuel for general purposes, and specially serviceable in melting metals. The sea ware or liquor thereof is added in varying quantities, and the excess of moisture driven off by heat or evaporated.

A.D. 1872, January 12.—No. 101.

LINDSAY, George, of Liverpool, in the county of Lancaster, engineer.—"Improvements in gearing or "apparatus for transmitting motion."

For the purpose of transmitting motion I employ (1), right and left screw threads or helices formed on the driving shaft, or on a pulley or drum secured thereon, gearing into left and right screw threads or helices formed on the driven shaft, or on a pulley or drum secured thereon; and (2), a right or left screw thread or helix on the driving shaft, or a pulley or drum secured thereto, gearing with a corresponding left or right screw thread or helix on the driven shaft, or a pulley or drum secured thereto.

A.D. 1872, January 12.—No. 102.

EDWARDS, John, of No. 6, Cassland Crescent, South Hackney.—"Improvements in the manufacture of "garters or belts, and fastenings for the same."

The novelty is covering garters or belts made of elastic material with a woven fabric, and fastening the ends of garters or belts made of india rubber (without being covered), by means of a slide or rivet, or their equivalent.

A.D. 1872, January 12.—No. 103.

JOHNSON, JOHN HENRY, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Ferdinand Blondin, of Paris, in the Republic of France.*)—"Improvements in the "treatment and utilization of acid gas tars."

The essential feature of this invention consists in combining the free sulphuric acid, contained in what are known as acid gas tars, with a base, such for example as soda or ammonia, by adding to the same either a solution of chloride of sodium or ammonium, and after separating the solutions of the sulphates thus produced, converting the same into valuable commercial products by evaporation and crystallization. The hydrochloric acid resulting from the decomposition of the chloride of sodium being utilized.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 6 to July 12, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, January 13.—No. 104.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from Ezra Cope and James Riley Maxwell, of Cincinnati, Ohio, United States of North America.*)—" Improvements in steam " engines for pumping and other purposes."

My improvement consists in moving the valves of steam engines by a rod or stem passing into the side of the valve box and made to take hold of the under part of the valve, usually in the exhaust opening of the valve; the valve rod is actuated by an eccentric or from the oscillating motion of the connecting rod.

Another portion of my invention is arranging the valves of vertical engines to work in a horizontal position attached to the side of the cylinder when moved by the pressure of steam from the cylinder.

Another portion of my improvement is the manner of constructing the cross head of engines by which the pin to which the connecting rod or rods are attached are made to work in a bearing formed in the cross head.

A.D. 1872, January 13.—No. 105.

BROWN, Robert, of No. 12, Albion Street, Leeds, in the county of York, gentleman.—" An improved " ventilating stove."

This invention refers to a peculiar mode of drawing out and consuming the vitiated air of an apartment, and at the same time admitting a supply of fresh air diffused in such a manner so as to prevent the perception of a current or draft.

A.D. 1872, January 13.—No. 110.

SWINBURN, John Field, of Birmingham, in the county of Warwick, gun manufacturer.—" Improve- " ments in breech loading small arms."

This invention refers to small arms in which the breech is opened and closed by a hinged falling block.

The block is worked by a lever as usual. The striking pin works in a cylindrical hole in the block, and is withdrawn, on the depression of the lever to open the breech, by means of a cross pin on the head of the lever engaging in a fork at the rear end of the striking pin. The striking pin when the block is raised is situated in a line with the axis of the barrel; the motion of the striker is consequently direct and there is little risk of miss-fire. The hammer turns on the same centre as the lever, and is cocked, on the depression of the lever to open the breech, by a shoulder on the tumbler engaging with a shoulder on the lever or by a heel piece on the block acting upon the hammer. The hammer is held in its cocked position by a sear taking into a bent in the tumbler, and is urged forward, on releasing the sear, by a mainspring connected with the tumbler. The main spring offers no resistance to the motion of the block to close the breech. The horizontal arm of cranked extractor lever is longer than the vertical arm which acts upon the cartridge case. On the descent of the hinged block, the extreme end of the extractor lever is first acted upon and the empty case started from the barrel; as the block further descends, it strikes against the extractor lever near its centre and ejects the empty case from the gun.

The trigger and guard plate is connected to the gun by the extractor pin and a second cross pin at the rear end of the plate which enters a half hole in the said end of the plate.

A.D. 1872, January 17.—No. 142.

NEWELL, Lorenzo Dow, merchant, of 514, Broadway, New York, in the United States of America, at present residing at the Castle and Falcon, Aldersgate Street, in the city of London.—"A new marine state "room."

I make use of a cylindrical chamber or room, suspended horizontally on board a ship on proper points; and inside this drum I suspend equally one or more berths or sofas with their axis of suspension at right angles with that of the drum. In order to balance such berth, I make use of a sliding weight suspended to the same, and which can be moved easily by the occupants.

I provide the drum with an appropriate door, windows, and curtains, which prevents the unpleasant sight of the rolling of the ship. In order to render the room stationary when desired, I make use of a bolt passing through its bottom into the framing of the ship, where it is screwed to render it temporarily stationary whilst a passenger is entering or leaving the same. I make use of a moveable footstep, which, actuated by the party resting on the same, throws out laterally two rods that press against the fixed partition of the ship and act the part of a brake.

For the purpose of ventilation, I avail myself of the oscillation of the drum to actuate a bellows or other appropriate blowing instrument, which draws fresh air from without and blows it into said drum or the compartment within which it is suspended.

A.D. 1872, January 17.—No. 144.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Joseph Wellington Frazier, of the city, county and state of New York, United States of America.*)—"Improvements in cartridge boxes and knapsacks."

The first part of this invention consists of a cartridge box, to the body of which a lid is hung, so as to require no such effort on the part of the soldier to keep the box open as the flap of an ordinary cartridge box demands. The second part of the invention of a knapsack and cartridge blocks relatively constructed so as to enable a soldier to carry into action an extra supply of ammunition without inconveniently loading his cartridge [*box**]. Also of cartridge blocks hinged together so that they can be readily folded for adjustment in a cartridge box and as readily unfolded for adjustment in the knapsack.

A.D. 1872, January 18.—No. 164.

ASHBERRY, Philip Henry, of Sheffield in the county of York.—"Improvements in machinery or "apparatus for casting articles in tin, lead, or other similar metals or alloys."

This machine is for the purpose of casting articles of tin, lead, &c., larger, thinner, harder, and the ornamentation more sharply defined than is effected by the ordinary process of casting such metals.

The improvements on the Patent No. 740, '66 are as follows:

1. The moulds are fixed and the pan is moveable.

2. The arrangement for opening and closing the moulds by means of a loop or link on the sliding shaft worked by the crank pin on the driving shaft.

3. The oscillation of the pan to and from the moulds by means of levers and rods connected with the crank of the driving shaft.

4. The manner of working the valves or openings in connection with the force pump by means of a rod having a valve block which is actuated through suitable levers by a cam and spring.

5. The "bit" or conductor between the exit from the pan and the entrance to the moulds.

6. The mode of raising the lever of the force pump by the crank or driving shaft.

7. The catch retaining the lever of the force pump and the rod actuated by a spring to knock it away (this is the same spring mentioned in clause No. 4.

8. The mode of stopping the machine, when the moulds are either open or closed, by means of a weight which is raised by a cam on a driving shaft and is allowed to fall at the proper time on the end of a lever which throws the clutch box out of gear.

9. The manner of weighting and stopping the lever of the force pump by means of a double ended lever, one end of which carries the weight and is connected with the lever of the force pump, and the other end working in guides may be stopped at different points by a pin or other appliance.

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* The word "box" is found in the copy of the Abridgment delivered by the Applicant, but does not appear in the original Abridgment.

A.D. 1872, January 19.—No. 174.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Jean Adrien de Mestre, a person resident at Paris, Rue du Port Mahon, merchant.*)—" A new and improved means " for securing corks or substitutes for corks in the mouths of bottles and such-like vessels, whether earthen- " ware, stoneware, or glass."

This invention relates to a wire slot cap and to special means of ligature, by which corks or substitutes for corks are secured in the mouths of bottles, and such like vessels, designed to contain gaseous or fermented liquids; and consists of one single piece of steel, iron, copper, or brass wire of a convenient length forming a netting, which wraps up the top face of the cork or substitutes for corks and the top end of the neck of the bottle or such like vessel.

A.D. 1872, January 19.—No. 184.

ANDREW, WILLIAM HENRY, of Sheffield, in the county of York.—" Improvements in securing and " ornamenting the handles of table cutlery and other articles."

This invention consists in securing knife handles and ivory handles for teapots by the use of a metal guard piece more or less ornamented, which extends across the end of the handle next the bolster and down one or both sides of the handle in the form of a tongue or tongues ; a hole being made in the cross piece for the passage of the tang, and a pin or pins being inserted transversely through the handle, through the tongue or tongues, and through the tang.

A.D. 1872, January 20.—No. 194.

SCRUTON, THOMAS KOSSUTH, of Birmingham, in the county of Warwick, tailor and outfitter.— " Improvements in the manufacture of neck ties or cravats."

According to this invention the material of which the sailor's knot of the neck tie or cravat is made is joined at the edge of the knot, or the knot is made of two pieces of material joined together at the opposite edges of the knot. Both faces of the knot have consequently the same appearance. The two depending ends of the tie or cravat are so fixed to the knot that their back or inner faces are turned towards each other. The free end of the neck band is fastened by a spring clip or pin in the interior of the knot as usual.

Neck ties or cravats so made may be worn with either side outwards, and can be put on with equal facility by right and left handed persons.

A.D. 1872, January 23.—No. 220.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Ellis Doty and George Washington Miltimore, both of Janesville, Rock county, state of Wisconsin, Rueben Mickel, of Chicago, Cork county, state of Illinois, and Ira Mickel, of New Lisbon, Otsego county, state of New York, all in the United States of America.*)—" Improvements in railway carriage axles " and wheels."

This invention has for its object to facilitate the movement of a railway carriage in rounding a curve.

For this purpose a hollow revolving axle is employed, upon which are loosely mounted the wheels supporting the carriage ; said axle being supported upon a fixed axle and so arranged as to revolve thereon simultaneously with an independent revolving movement of the wheels.

The invention further relates to the construction of the said hollow axle and wheels whereby the same can be properly lubricated.

A.D. 1872, January 24.—No. 226.

BERTIEAUX, HENRI, of Antwerp, in the Kingdom of Belgium.—" Improvements in compound high and " low pressure steam engines."

The high and low pressure cylinders are constructed of one piece with a common axis, the pistons being connected together by a rod. The cylinders are either provided with separate slides connected by a rod so as to move together, or the admission of steam to both cylinders is regulated by one single slide, the steam and eduction ports being in either case so arranged that the steam passes from the high pressure into the low pressure cylinder.

The space between the two pistons is made to communicate with the atmosphere by means of apertures in the low pressure cylinder.

A.D. 1872, January 24.—No. 237.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 6, Piccadilly, in the county of Middlesex, and 18, Rue de la Chaussée d'Antin, Paris, France, patent agent.—(*A communication from Charles Alexandre Furon, a person resident at Belleville, France, machinist.*)—" A new and improved bellows " for forges, furnaces, or any other works."

This invention consists to give to the air feeding mouth a diameter twice as large as that of the outlet mouth, and to place the said outlet mouth on one of the sides of the casing of the bellows, and to keep in place the helix by means of moveable rings or hoops regulated by adjusting screws.

A.D. 1872, January 25.—No. 249.

ABRAHAM, George, of Taunton, in the county of Somerset, ironmonger.—" Improvements in the " fittings of window sashes."

This invention consists in fitting to the edges of window sashes plates with holes in them, into which holes rollers mounted in the window frames are pressed by springs so as to hold the sashes against their weight unless force be applied to them sufficient to cause the rollers to be pushed back out of the holes.

It also consists in fitting such spring rollers with bolts or with means of turning them at right angles, so as to make them act as bolts to fasten the sashes.

A.D. 1872, February 15.—No. 480.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Haineworth, of Pittsburgh, Pennsylvania, in the United States of America.*)—" Improvements in moulds and cores, and in mould and core linings and facings for metal " castings, and in materials employed therefor."

This invention consists in using pulverized coke mixed with sour beer, fire clay water, molasses, or other similar fluid as a material for forming moulds and cores for metal castings or as a lining for such moulds and cores.

A.D. 1872, July 6.—No. 2050.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from George Rodney Meneely, of West Troy, New York, United States of America.*)—" An improved process of welding brass or other alloy of copper upon iron or steel, applicable to " the construction of journal boxes or axle-bearings for railway carriages and machinery."

The first part of this invention relates to a process of welding brass, bronze, or alloy of copper upon cast or wrought iron or steel. The surface of iron or steel is prepared by cleansing, and placed in a mould or flask. The brass after being heated is poured into the flask. In this process it is unnecessary to heat the iron or steel before placing it in the flask or mould. The second part of the said invention consists in the production or manufacture of journal-boxes or axle bearings by the above described process. This part of my invention consists in constructing a box or bearing of an outer jacket of wrought or cast iron, malleable cast iron, or " Bessemer " steel, enveloping and protecting a brass, bronze, or bell-metal bearing; the said outer jacket being firmly welded to the bronze metal bearing.

A.D. 1872, July 9.—No. 2065.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Chester W. M. Smith, of San Francisco, California, United States of America.*)—" An improved compound and method of preparing the same for the construction of street " pavements and for other like purposes."

The object of this invention is to provide an improved pavement for streets that will be impervious to the influence of the weather, and of great durability. I use asphaltum or a bituminous substance and pulp made from wood, the union of these substances being such that the compound will not be affected by heat or cold, or easily worn out. In the first place I pulp the wood, then mix it with the asphaltum and boil them together; then the product is pressed into blocks and laid down.

A.D. 1872, July 10.—No. 2077.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Jules Maurice Fabre, a person residing at Rue Monthyon, Paris, in France.*)—" Improvements in bits."

The object of the invention is to alleviate or suppress the acute and unbearable pain suffered by horses from the action of the bits hitherto employed, and consists in making the mouth piece or bit, properly so called, and the branches moveable, and in giving a flattened form to the part of the said bit which bears on the bars of the animal's mouth.

A.D. 1872, July 10.—No. 2083.

TOWNSEND, HENRY ELMER, of Boston, Massachusetts, United States of America, now of No. 8, Southampton Buildings, London.—" Improvements in the standing rigging of ships and other vessels."

My said invention relates to a simple contrivance which renders practicable the substitution of metal rods or bars for the ordinary wire ropes used as ship's standing rigging, and it affords the means whereby such rigging may be made of great strength and yet have sufficient elasticity or capability of yielding under sudden or severe strains to prevent the injurious effects frequently experienced on board ships fitted with the ordinary rigging. The said invention consists in the combination of metal rods or bars with elastic couplings, or connections which have coiled springs made of thin flat taper plates of steel.

A.D. 1872, July 11.—No. 2098.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Oliver Hildreth Keep, of the city and state of New York, United States of America.*)—" Improvements in shirts."

The present invention consists principally in a shirt front bosom and yoke (either with or without the neck-band), combined in such a manner as to cause them to conform to the shape of a person having a certain neck measurement. It consists farther in a shirt front yoke and bosom combined in the usual manner, and provided with suitable guide marks or lines whereby the dimensions of the same may be varied to cause the article to fit any person of ordinary size.

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AND TO

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  Hughes (*Bicheroux*), 1598 (*App.* 48.)

Fulling and felting; felted fabrics:
  Carlile, 71.

Furnaces and cupolas:
  Irving, 11.
  Johnson (*Sellers & Sellers*), 50.
  Johnson (*Sellers*), 59.
  Montgomerie, 79.
  Johnson (*Sellers*), 80.
  Healey, 85.
  Kent, 90.
  Schemioth, 94.
  Bonneville (*Furon*), 237 (*App.* 2.)
  Sheffield, 1435 (*App.* 46.)
  Monckton, 1460 (*App.* 46.)
  Hughes (*Bicheroux*), 1598 (*App.* 48.)
  Haseltine (*Middleton*), 1801 (*App.* 50.)

Furniture:
  Lake (*Curtis*), 1499 (*App.* 46.)
  Lake (*Glassie, Nash & Armes*), 1961 (*App.* 52.)

Furs (imitation):
  De Montoison, 12.

G.

Garters:
  Edwards, 102.

Gas and other burners and regulators; gas fittings; lighting gas:
  Fothergill, 62.
  Schlesinger (*Dixon*), 98.
  Bonneville (*Allen & Dewey*), 375 (*App.* 32.)
  Lake (*Batchelder*), 783 (*App.* 37.)
  Lake (*Raynor*), 977 (*App.* 40.)

Gas-engines. *See* "Air-engines."

Gas extinguishers:
  Bonneville (*Allen & Dewey*), 375 (*App.* 32.)

Gas making and purifying; gasometers:
  Scott, 38.
  Healey, 85.
  Clark (*Floyd, Dieterich & Schüssler*), 901 (*App.* 39.)
  Monckton, 1460 (*App.* 46.)

Gauges:
  Ducomet, 1754 (*App.* 50.)

Gems or precious stones:
  Nourick & Wild, 22.

Ginning cotton. *See* "Spinning (opening)."

Glass and its applications:
  Hyatt, 25.
  Newton (*Hoe*), 45.
  Lake (*Radde*), 121 (*App.* 29.)
  Sheffield, 1435 (*App.* 46.)
  Monckton, 1460 (*App.* 46.)

Gloves:
  Timbrill (*Harrison*), 390 (*App.*

- **Governors; speed and power indicators:**
  - Lake (*Duff*), 722 (*App.* 36.)
- **Gradings:**
  - Lake (*Carter*), 992 (*App.* 40.)
- **Gratings for roofs, areas, &c.:**
  - Hyatt, 25.
- **Grease:**
  - Toepler, 3.
  - Johnson (*Enault & Co.*), 1951 (*App.* 52.)
- **Grinding, crushing and pulverising ores, quartz, &c.:**
  - Sullivan, 1689 (*App.* 49.)
- **Grinding and surfacing:**
  - Lake (*Gear*), 579 (*App.* 34.)
- **Guano (bags for containing).** *See* "Bags."
- **Gums; gummy substances:**
  - Smith (*Du Motay*), 2.

H.

- **Hair and fur:**
  - De Montoison, 12.
- **Hammers:**
  - Schlesinger (*Dixon*), 98.
- **Hanks for sails:**
  - Low, 530 (*App.* 34.)
- **Harness and saddlery:**
  - Fish & Wotherspoon, 7.
  - Bonneville (*Fabre*), 2077 (*App.* 2.)
- **Harrows.** *See* "Ploughs."
- **Harvesting machines.** *See* "Reaping."
- **Hat bands:**
  - Carlile, 71.
- **Hats, caps, bonnets; coverings for the head:**
  - De Montoison, 12.
  - Collinson, 68.
  - Carlile, 71.
- **Heaters, foot-warmers, &c.:**
  - Parker, 57.
- **Heating and evaporating; regulating heat:**
  - Lyttle, 31,
  - Gilbee (*Argall*), 41.
  - Johnson (*Sellers & Sellers*), 50.
  - Fothergill, 63.
  - Montgomerie, 79.
  - Healey, 85.
  - Kent, 90.
  - Lake (*Chase & Platt*), 961 (*App.* 40.)
  - Lake (*Caumon*) (*Absterdam*)), 1135 (*App.* 42.)
  - Sheffield, 1435 (*App.* 46.)
  - Hughes (*Bicheroux*), 1598 (*App.* 48.)
  - Haseltine (*Middleton*), 1801 (*App.* 50.)
- **Heating or warming buildings:**
  - Parker, 57.
  - Brown, 105 (*App.* 2.)
  - Edwards (*Blessing, Townsend & Jackson*), 1139 (*App.* 42.)
- **Heckling fibrous materials.** *See* "Spinning (carding)."
- **Hoists; raising, hauling and lowering heavy bodies:**
  - Mills (*Cathcart, Ezekiel & Faehtz*), 61.
  - Pieper, 67.
  - Clark, 70.
- **Hooks; hooking:**
  - Mills (*Cathcart, Ezekiel & Faehtz*), 61.
- **Hops:**
  - Lake (*Clarke*), 329 (*App.* 31.)
- **Horse-shoes; shoeing horses:**
  - Brown (*Fuller*), 950 (*App.* 40.)
- **Horticulture; horticultural buildings; forcing houses:**
  - Lake (*Passmore*), 538 (*App.* 34.)

I.

- **Incrustation and sediment (preventing).** *See* "Oxidation."
- **India-rubber (treatment and application):**
  - Hyatt, 40.
  - Gilmore, 58.
  - Ronald & Farmer, 89.
  - Benson (*Lewis & Way*), 1258 (*App.* 44.)
- **Indicating distance of objects;**
  - Lake (*Biggs*), 1019 (*App.* 40.)
- **Indicating value of coins dropped in tills:**
  - Hookham, 1938 (*App.* 52.)
- **Indigo.** *See* "Dyes."
- **Inks; inking:**
  - Newton (*Hoe*), 45.
  - Edwards, 73.
  - Wheatstone & Stroh, 473 (*App.* 33.)
- **Insects (destroying):**
  - Brandon (*De Gonzalo & Grisei*), 82.
- **Insulating wire:**
  - Lake (*Radde*), 121 (*App.* 29.)
- **Ivory.** *See* "Bones."

J.

- **Jewellery; jewel cases:**
  - Nourick & Wild, 22.
  - Clark (*Edge*), 414 (*App.* 32.)
- **Joining, coupling, joints and hinges:**
  - Fish, 6.
  - Spence, 56.
  - Lake (*Radde*), 121 (*App.* 29.)
  - Taylor & Larkin, 533 (*App.* 34.)
  - Clark (*Floyd, Dieterich & Schüssler*), 901 (*App.* 39.)
  - Smith, 921 (*App.* 39.)
  - Lake (*Curtis*), 1499 (*App.* 46.)
  - Lake (*Glassie, Nash & Armes*), 1957 (*App.* 52.)
  - Lowry, 1966 (*App.* 52.)
- **Jugs:**
  - Gilmore, 58.

K.

- **Knapsacks:**
  - Johnson (*Frazier*), 144 (*App.* 2.)
- **Knitted fabrics (metallic):**
  - Clark (*Edge*), 414 (*App.* 32.)
- **Knitting machines:**
  - Smith (*Poron & Poron*), 204 (*App.* 30.)
- **Knives and forks:**
  - Andrew, 184 (*App.* 2.)

L.

- **Lasts:**
  - Lake (*Mills & Taylor*), 500 (*App.* 33.)
- **Lavatories, wash-stands and appliances:**
  - Gowans, 87.
  - Lake (*Daniels*), 1500 (*App.* 46.)
- **Lawn-mowers.** *See* "Horticulture."
- **Leather, skins and hides:**
  - Tullis, 8.
  - De Montoison, 12.
  - De Montoison, 13.
- **Let-off motion in looms:**
  - Lake (*Day*), 10.
- **Life boats; life boat stations:**
  - Jones & Green, 1082 (*App.* 41.)
- **Life preservers; saving from drowning:**
  - Brandon (*De Gonzalo & Grisei*), 82.
- **Lighting gas.** *See* "Gas burners."
- **Locks, latches and lock furniture:**
  - Lake (*Shepard & Seaman*), 444 (*App.* 33.)
- **Lubricating.** *See* "Oiling."

M.

- **Magnesia and its salts:**
  - Solvay, 1525 (*App.* 47.)
- **Mail and despatch bags:**
  - Fish & Wotherspoon, 7.
- **Marble.** *See* "Stone."
- **Marking or numbering casks, cases, boxes, &c.** *See* "Branding."
- **Measuring and indicating speed of ships:**
  - Lake (*Biggs*), 1019 (*App.* 40.)
- **Medallion carving:**
  - Cunningham, 55.
- **Medical treatment of animals:**
  - Benson (*Lewis & Way*), 1258 (*App.* 44.)

Medical treatment of man:
- Sullivan, 111 (*App.* 45.)

Medicines:
- Lake (*Clarke*), 329 (*App.* 31.)

Mercury:
- Coffey, 64.

Metals (casting and moulding):
- Johnson (*Sellers*), 80.
- Ashberry, 164 (*App.* 2.)
- Ireland & Ireland, jun. (*Pink*), 429 (*App.* 33.)
- Abel (*Hainsworth*), 480 (*App.* 2.)
- Washburn, 620 (*App.* 35.)
- Johnson, 732 (*App.* 37.)
- Carter & Carter, 1434 (*App.* 46.)

Metals (compressing or "upsetting"):
- Lake (*West*), 1408 (*App.* 45.)

Metals (forging, hammering, welding, bending and shaping):
- Bonneville (*Furon*), 237 (*App.* 2.)
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Lake (*Meneely*), 2050 (*App.* 2.)

Metals (rolling):
- Johnson, 732 (*App.* 37.)
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Sullivan, 1689 (*App.* 49.)

Metals (smelting, reducing and refining); treating ores; obtaining iron:
- Johnson (*Sellers & Sellers*), 50.
- Johnson (*Sellers*), 59.
- Montgomerie, 79.
- Healey, 85.
- Sellars, 100.
- Bossé (*Viger*), 243 (*App.* 30.)
- Ireland & Ireland, jun. (*Pink*), 429 (*App.* 33.)
- Bonneville (*Thomas - Payen & Roux*), 1046 (*App.* 41.)
- Bousfield (*Post*), 1422 (*App.* 45.)
- Monckton, 1460 (*App.* 46.)
- Hughes (*Bicheroux*), 1598 (*App.* 48.)
- Haseltine (*Middleton*), 1801 (*App.* 50.)
- Hampton, 1837 (*App.* 51.)
- Richter, 2023 (*App.* 1.)

Meters for gas and fluids:
- Hunt (*Sickels & Thorndike*), 83.
- Budenberg (*Schäffer & Budenberg*), 95.
- Andrews, 99.

Milk cans:
- Lake (*Shepard & Seaman*), 444 (*App.* 33.)

Millstones. *See* "Stone."

Mining, quarrying, getting coal and other minerals:
- Beaumont & Appleby, 392 (*App.* 32.)

Mittens:
- Timbrill (*Harrison*), 390 (*App.* 50.)

Mixing, mashing and stirring:
- Benson (*Honell*), 799 (*App.* 38.)

Money tills:
- Hookham, 1938 (*App.* 52.)

Motive-power (gunpowder). *See* "Air-engines."

Motive-power (mechanical):
- Bonneville (*Cavalerie*), 1478 (*App.* 46.)

Motive-power (steam). *See* "Steam-engines."

Moulding fuel:
- Sellars, 100.

Mouldings and architectural ornaments:
- Cunningham, 55.

Muffs; finger protectors:
- Carlile, 71.
- Price, 91.

Mules. *See* "Spinning, twisting."

Musical instruments:
- Wheatstone & Stroh, 39.
- Lake (*Steinway*), 1459 (*App.* 46.)

N.

Nail and tack drawers:
- Schlesinger (*Dixon*), 98.

Nails, spikes and rivets; nailing:
- Lake (*Blake*), 264 (*App.* 30.)
- Brown (*Fuller*), 950 (*App.* 40.)

Neck-ties or cravats:
- Clark (*Klotz, jun. & Co.*), 47.
- Scruton, 194 (*App.* 2.)

Needle sheaths and protectors:
- Jenkins, 1106 (*App.* 42.)

Needle threaders:
- Lake (*Mercer*), 120 (*App.* 1.)

Needles and cases:
- Harper, 75.

Noxious gases and vapours (arresting and preventing):
- Clark, 27.
- Gowans, 87.
- Ronald & Farmer, 89.
- Lake (*Daniels*), 1500 (*App.* 46.)

O.

Oiling or lubricating; materials for oiling:
- Newton (*Mettam & Sanson*), 46.
- Clark (*Doty, Miltimore, Mickel & Mickel*), 220 (*App.* 2.)
- Lake (*Clark*), 251 (*App.* 30.)
- Benson (*Honell*), 799 (*App.* 38.)
- Porritt, 1107 (*App.* 42.)
- Dupré, 1541 (*App.* 47.)

Oils (animal):
- Coffey, 64.

Oils from seeds; vegetable oils:
- Coffey, 64.
- Platt, 969 (*App.* 40.)

Oils of tar, mineral oils, hydrocarbons:
- Coffey, 64.
- Benson (*Honell*), 799 (*App.* 38.)

Opening boxes:
- Schlesinger, (*Dixon*), 98.

Ores (bags for containing). *See* "Bags."

Oxidation and incrustation (preventing and removing):
- Lake (*Ellsworth*), 900 (*App.* 39.)
- Smith, 921 (*App.* 39.)
- Lake (*Caumon* (*Absterdam*)), 113 (*App.* 42.)

P.

Packing for steam-engines, pumps, valves, &c.:
- Fish, 6.
- Clark (*Floyd, Dieterich & Schieler*), 901 (*App.* 39.)
- Sullivan, 1689 (*App.* 49.)

Pails:
- Lake (*Shepard & Seaman*), 444 (*App.* 33.)

Paints; painting:
- Morton, 96.
- Bonneville (*Charton*), 1079 (*App.* 41.)

Paper, papier mâché, paper pulp (making):
- Edwards, 73.
- De Negri, 76.
- Granville, 605 (*App.* 35.)
- Platt, 969 (*App.* 40.)

Paper (application of):
- Bash, Bash & Bash, 52.
- Edwards, 73.
- Lake (*Croasdale*), 148 (*App.* 29.)

Paper (cutting and ornamenting):
- Morton, 96.
- Lake (*Warth & Jobbins*), 536 (*App.* 34.)

Paving. *See* "Road making."

Phosphates (bags for containing). *See* "Bags."

Photography:
- Edwards, 73.

Pickers for looms. *See* "Weaving (pickers)."

Pictures:
- Edwards, 73.

Pile driving; piles:
- Smith, 921 (*App.* 39.)

Pills; administering pills:
- Sullivan, 111 (*App.* 45.)

Pincers:
- Schlesinger (*Dixon*), 98.

Pins; breast pins; sticking pins in paper:
- De Forest, 1564 (*App.* 47.)
- De Forest, 1565 (*App.* 47.)

Pipes, tubes and syphons:
- Fish, 6.
- Tullis, 8.
- Spence, 56.
- Healey, 85.
- Ronald & Farmer, 89.
- Kent, 90.
- Lake (*Radde*), 121 (*App.* 29.)
- Johnson, 732 (*App.* 37.)
- Allen, 894 (*App.* 39.)
- Smith, 921 (*App.* 39.)
- Carter & Carter, 1434 (*App.* 46.)
- Lake (*Daniels*), 1500 (*App.* 46.)

Pistons and piston packings :
- Fish, 6.
- Caspersen (*Blair*), 28.
- Benson (*Cope & Maxwell*), 104 (*App.* 2.)
- Geneste, 241 (*App.* 46.)
- Lake (*Brayton*), 432 (*App.* 33.)
- Porritt, 1107 (*App.* 42.)
- Sullivan, 1689 (*App.* 49.)

Planing. *See* "Cutting."

Plants and trees (application of) :
- Brandon (*De Gonzalo & Grisei*), 82.
- Smith, 1802 (*App.* 51.)

Ploughing, tilling and cultivating land :
- Lewis, 60.
- Hill, 65.
- Lake (*Carter*), 992 (*App.* 40.)
- Lake (*Caumon (Absterdam)*), 1135 (*App.* 42.)
- Lake (*Baxter*), 1244 (*App.* 43.)
- Porter, 1820 (*App.* 51.)

Pneumatic conveyances :
- Lake (*Radde*), 121 (*App.* 29.)

Polishing and burnishing; polishing powders :
- Hodges, 733 (*App.* 37.)

Potash. *See* "Alkalies."

Powders (administering) :
- Sullivan, 111 (*App.* 45.)

Precious stones. *See* "Gems."

Preserving and preparing articles of food :
- Newton (*Barre-Pin & Barre-Pin*), 37.
- Johnson (*Enault & Co.*), 1951 (*App.* 52.)

Presses, compressing and packing :
- MacDonald & Eskrett, 62.
- Hodgart (*Jones*), 88.
- Schemioth, 94.
- Bonneville (*Le Clercq*), 238 (*App.* 30.)
- Lake (*Clarke*), 329 (*App.* 31.)
- Lake (*Seibert*), 525 (*App.* 34.)
- Ducomet (*Legris*), 1272 (*App.* 44.)

Printing paper; composing and distributing type :
- Newton (*Hoe*), 45.
- Cunningham, 55.
- Edwards, 73.

Projectiles. *See* "Shot."

Propelling carriages; locomotion on land :
- Roberts, 696 (*App.* 36.)
- Lake (*Baxter*), 1244 (*App.* 43.)

Propelling machinery (feed mechanism) :
- Morton, 96.
- Barthelmes, 291 (*App.* 48.)
- Lake (*Warth & Jobbins*), 536 (*App.* 34.)
- Brown (*Fuller*), 950 (*App.* 40.)
- Crighton, 1152 (*App.* 42.)
- Mawhinney (*Wiggin*), 1403 (*App.* 45.)

Propelling machinery (gauges, guides and traversers) :
- Lake (*Warth & Jobbins*), 536 (*App.* 34.)

Propelling or driving machinery; transmitting power and motion :
- Newton (*Hoe*), 45.
- Lindsay, 101.
- Baumann, 389 (*App.* 32.)
- Clark (*Edge*), 414 (*App.* 32.)
- Lancaster & Bullough, 683 (*App.* 36.)
- Bousfield (*Herrick*), 1016 (*App.* 40.)
- Fenno & Howe, 1871 (*App.* 51.)
- Lowry, 1966 (*App.* 52.)

Propelling ships; locomotion on water :
- Pieper, 67.
- Barker, 84.
- Hodgson, 447 (*App.* 41.)

Pulleys and pulley blocks :
- Pieper, 67.
- Low, 530 (*App.* 34.)
- Lowry, 1966 (*App.* 52.)

Pulp for making paper. *See* "Paper."

Pumps; raising and pumping water and other liquids :
- Fish, 6.
- Benson (*Cope & Maxwell*), 104 (*App.* 2.)
- Hanscom, 181 (*App.* 29.)
- Geneste, 241 (*App.* 46.)
- Baumann, 389 (*App.* 32.)
- Sullivan, 1689 (*App.* 49.)

Punching metals. *See* "Boring."

Punching or piercing leather, &c. :
- Tullis, 8.
- Mawhinney (*Wiggin*), 1403 (*App.* 45.)

R.

Railway carriages :
- Galloway, 14.
- Edwards (*Thornton & Buckland*), 495 (*App.* 33.)
- Lake (*Emery, Doyen & Sparrow*), 770 (*App.* 37.)
- Lynch, 1861 (*App.* 51.)

Railway rolling stock (cleaning or washing) :
- Earl of Caithness, 48.

Railways (coupling and joining carriages) :
- Taylor & Larkin, 533 (*App.* 34.)

Railways (permanent way, rails, chairs and sleepers) :
- Ireland & Ireland, jun. (*Pink*), 429 (*App.* 33.)
- Lake (*Caumon (Absterdam)*), 1135 (*App.* 42.)
- Boone & Herman, 1590 (*App.* 47.)

Reaping; mowing; making hay :
- Lake (*Miller*), 481 (*App.* 33.)
- Haseltine (*Osborne*), 537 (*App.* 34.)
- Lake (*Passmore*), 538 (*App.* 34.)

Reflectors :
- Lake (*Mercer*), 120 (*App.* 1.)

Registering, indicating and marking apparatus :
- Lake (*Warth & Jobbins*), 536 (*App.* 34.)

Resin; resinous substances :
- Smith (*Du Motay*), 2.
- Platt, 969 (*App.* 40.)

Retorts :
- Clark (*Floyd, Dieterich & Schüssler*), 901 (*App.* 39.)
- Monckton, 1460 (*App.* 46.)

Road making and paving :
- Lyttle, 31.
- Norris, 1031 (*App.* 41.)
- Boone & Herman, 1590 (*App.* 47.)
- Tucker, 1669 (*App.* 49.)
- Parlour, 2014 (*App.* 1.)
- Lake (*Smith*), 2065 (*App.* 2.)

Rock drills. *See* "Boring."

Rolling metals. *See* "Metals (rolling)."

Roofing :
- Hyatt, 25.
- Lake (*Cornell*), 960 (*App.* 40.)
- Tucker, 1669 (*App.* 49.)

Ropes, cordage, twine, oakum, wire ropes :
- Fish & Wotherspoon, 7.

Rotary spaders or diggers. *See* "Digging."

Rugs :
- De Montoison, 12.

S.

Safes :
- Lake (*Caumon (Absterdam)*), 1135 (*App.* 42.)

Sail cloth. *See* "Ships' sails."

Sail hanks. *See* "Hanks."

Salts :
- Coffey, 64.

School desks and furniture :
- Lake (*Curtis*), 1499 (*App.* 46.)

Scissors and shears :
- Foveaux, 74.
- Hunt (*Wehrlin*), 1903 (*App.* 52.)

Screw drivers :
- Schlesinger (*Dixon*), 98.

Sea-weed (treating) :
- Sellars, 100.

Setting tires on wheels. *See* "Wheels for carriages."

Sewing and embroidering :
- Hughes, 15.
- Lake (*Mercer*), 120 (*App.* 1.)
- Barthelmes, 291 (*App.* 48.)
- Lake (*Mills & Taylor*), 500 (*App.* 33.)
- Campion, 534 (*App.* 34.)
- Bousfield (*House*), 710 (*App.* 36.)
- Bousfield (*Herrick*), 1016 (*App.* 40.)

Shafts and shafting :
- Lake (*Caumon (Absterdam)*), 1135 (*App.* 42.)

Shearing animals :
- Hunt (*Wehrlin*), 1903 (*App.* 52.)

Ship and boat building :
- Mayler, 20.
- Spence, 56.
- Clark, 70.
- Newell, 142 (*App.* 2.)
- Lake (*Caumon (Absterdam)*), 1135 (*App.* 42.)
- Allen, 2034 (*App.* 1.)

Ships' boats (lowering, raising and disengaging) :
Mills (*Cathcart, Ezekiel & Faehtz*), 61.
Jones & Green, 1082 (*App.* 41.)

Ships of war :
Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)

Ships' rigging :
Fish & Wotherspoon, 7.
Townsend, 2083 (*App.* 2.)

Ships' sails :
Fish & Wotherspoon, 7.
Low, 530 (*App.* 34.)

Shirts :
Lake (*Keep*), 2098 (*App.* 2.)

Shot, shell and other projectiles :
Boyd (*Wallace*), 1830 (*App.* 51.)

Shutters :
Hyatt, 40.

Shuttles used in sewing. *See* "Sewing."

Shuttles used in weaving. *See* "Weaving."

Signals, alarms and communicating apparatus :
Highton, 4.
Galloway, 14.
Handcock, 16.
Garrood & Hardmet, 51.
Calahan, 1537 (*App.* 47.)
Sullivan, 1689 (*App.* 49.)
Hookham, 1938 (*App.* 52.)

Sinks :
Gowans, 87.

Sizing, dressing and gumming yarns :
Lancaster & Bullough, 683 (*App.* 36.)

Skates :
Pennell, 54.

Sketching. *See* "Drawing."

Skylights. *See* "Windows."

Smoke prevention ; burning and consuming smoke :
Kent, 90.

Soap :
Platt, 969 (*App.* 40.)

Soda. *See* "Alkalies."

Sowing seed ; distributing manure :
Harrison, 77.

Spark arresters :
Edwards (*Thornton*), 1969 (*App.* 52.)

Spectacles ; eye protectors :
Vale, 72.

Spindles ; spindles and flyers :
Cunningham, 55.
Porritt, 1107 (*App.* 42.)

Spinning and twisting asbestos or amianthus :
Fish, 6.
Fish & Wotherspoon, 7.

Spinning, twisting, doubling and throwing fibrous materials :
Gilmore, 29.
Hepworth & Hepworth, 53.
Nutting, 1035 (*App.* 41.)
Bonneville (*Martin*), 1078 (*App.* 41.)
Porritt, 1107 (*App.* 42.)
Lake (*Sutherland*), 1418 (*App.* 45.)

Spinning (carding, combing and heckling fibrous materials) :
Whitehead, 23.
Holden, 44.
Mewburn (*Droulers-Vernier*), 511 (*App.* 49.)
Lake (*Chase & Platt*), 961 (*App.* 40.)
Lowry, 1966 (*App.* 52.)

Spinning (opening, ginning and cleaning fibrous materials) :
Madden (*Bourne*), 118 (*App.* 1.)
Lawson (*Girardini*), 625 (*App.* 35.)
Lake (*Hail*), 717 (*App.* 36.)
Crighton, 1152 (*App.* 42.)

Stamping or shaping articles in metal :
Lake (*Shepard & Seaman*), 444 (*App.* 33.)

Steam-boiler furnaces. *See* "Furnaces."

Steam-boilers and generators ; generating and superheating steam :
Fish, 6.
MacDonald & Eskrett, 62.
Montgomerie, 79.
Healey, 85.
Johnson, 732 (*App.* 37.)
Allen, 894 (*App.* 39.)
Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
Cazier, 1941 (*App.* 52.)

Steam-boilers (cleansing and preventing incrustation of) :
Smith, 921 (*App.* 39.)

Steam-boilers (water feeding and heating) :
Gilbee (*Argall*), 41.
Allen, 894 (*App.* 39.)

Steam-engines (stationary, locomotive and marine) :
Caspersen (*Blair*), 28.
Schemioth, 92.
Benson (*Cope & Maxwell*), 104 (*App.* 2.)
Bertieaux, 226 (*App.* 2.)
Lake (*Clark*), 251 (*App.* 30.)
Baumann, 389 (*App.* 32.)
Johnson, 732 (*App.* 37.)
Lake (*Baxter*), 1244 (*App.* 43.)
Edwards (*Thornton*), 1969 (*App.* 52.)

Steam pumps. *See* "Pumps."

Steam traps :
Edwards (*Blessing, Townsend & Jackson*), 1139 (*App.* 42.)

Steering and guiding ploughs :
Hill, 65.

Steering and guiding ships :
Lester, jun., 19.

Sticking pins in paper. *See* "Pins."

Stone, slate and marble ; millstones and grindstones :
Mortlock, 34.
Cunningham, 55.

Stone, &c.—*cont.*
Beaumont & Appleby, 302 (*App.* 32.)
Lake (*Gear*), 579 (*App.* 34.)
Tucker, 1669 (*App.* 49.)

Stone breakers :
Sullivan, 1689 (*App.* 49.)

Stop motions ; throwing out of gear :
Lake (*Benton*), 157 (*App.* 29.)
Ashberry, 164 (*App.* 2.)
Corney & Turner, 1927 (*App.* 52.)
Richter, 2023 (*App.* 1.)

Stopping trains. *See* "Breaks for carriages."

Stoves. *See* "Fire-places."

Studs. *See* "Buttons."

Subsoiling. *See* "Ploughing."

Sulphur :
Coffey, 64.

Surgical instruments :
Foveaux, 74.

Surveying instruments :
Lake (*Biggs*), 1019 (*App.* 40.)

T.

Tanning skins. *See* "Leather."

Tapestry (imitation) :
Bonneville (*Charton*), 1079 (*App.* 41.)

Tar ; acid tars :
Coffey, 64.
Johnson (*Blondin*), 103.

Teapots :
Andrew, 184 (*App.* 2.)

Telegraphic printing :
Wheatstone & Stroh, 473 (*App.* 33.)

Telegraphs (electric) :
Highton, 4.
Harling, 81.
Robson, 86.
Lake (*Radde*), 121 (*App.* 29.)
Wheatstone & Stroh, 473 (*App.* 33.)
Calahan, 1537 (*App.* 47.)

Theodolites :
Lake (*Biggs*), 1019 (*App.* 40.)

Thief detectors :
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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 12, 1872, and to Appendixes from January 13 to July 12, 1872.

This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. Terms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where also single copies may be obtained at 4*d.* each, except the last number (containing the complete Indexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders to be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commissioners of Patents.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn.
Friday, July 19, 1872.

CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 13 to January 19, 1872.

A.D. 1872, January 13.—No. 104.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from Ezra Cope and James Riley Maxwell, of Cincinnati, Ohio, United States of North America.*)—"Improvements in steam "engines for pumping and other purposes."

My improvement consists in moving the valves of steam engines by a rod or stem passing into the side of the valve box and made to take hold of the under part of the valve, usually in the exhaust opening of the valve; the valve rod is actuated by an eccentric or from the oscillating motion of the connecting rod.

Another portion of my invention is arranging the valves of vertical engines to work in a horizontal position attached to the side of the cylinder when moved by the pressure of steam from the cylinder.

Another portion of my improvement is the manner of constructing the cross head of engines by which the pin to which the connecting rod or rods are attached are made to work in a bearing formed in the cross head.

A.D. 1872, January 13.—No. 105.

BROWN, Robert, of No. 12, Albion Street, Leeds, in the county of York, gentleman.—"An improved "ventilating stove."

This invention refers to a peculiar mode of drawing out and consuming the vitiated air of an apartment, and at the same time admitting a supply of fresh air diffused in such a manner so as to prevent the perception of a current or draft.

A.D. 1872, January 13.—No. 106.

SEDDON, John Pollard, of No. 12, Park Street, Westminster, in the county of Middlesex, architect. —"Improvements in the means of ventilating the sewers, soil pipes, and cesspools of dwellings, and "deodorizing the gases evolved therefrom."

This invention consists in connecting all soil pipes, sewers, and cesspools of dwellings with an ascending pipe or flue, in any part of which is introduced a receptacle containing deodorizing material, so that the foul air in ascending through the flue has to pass through the deodorizing material before issuing into the atmosphere.

A.D. 1872, January 13.—No. 107.

KOCHS, William Edward, of Manchester, in the county of Lancaster, engineer.—"Improvements in "means for effecting the transference of railway trains to and from ferry-boats or floating vessels."

This invention consists in sustaining a jointed viaduct upon pontoons, which are fitted to rise and fall in and over caissons, the said caissons preventing the pontoons from falling below certain fixed points, so that whatever may be the amount of difference in level between high and low water no part of the viaduct will at any time have such an inclination as will prevent the trains from running directly from the railway to the boat or vice versa.

A.D. 1872, January 13.—No. 108.

BAGGS, Isham, of High Holborn, in the county of Middlesex.—"Improvements in machinery and "apparatus for cutting, marking, stamping, and producing lines, indentations, and devices, on metallic "and other surfaces."

This invention consists in certain electric arrangements by means of which tracing and copying points forming part of an electric circuit can be made to cut, mark, stamp, and produce lines, indentations and devices on metallic and other surfaces.

A.D. 1872, January 13.—No. 109.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, engineer.—"Improvements in telegraph poles, and in the means and apparatus for fastening and securing the "telegraph wires thereto; which improvements are partly applicable to other purposes, and to existing "telegraph poles and insulators."

The features of novelty are:

Firstly. The construction of a telegraph pole of cast iron in two or more joints with wide horizontal bearings at the joints so as to ensure steadiness.

Secondly. The construction of a pole on the aforesaid principle, with the addition of lateral bow-sprit bracings of wrought iron to resist lateral strains.

Thirdly. The adoption of a screw clamp instead of the present wire binding, as the means of fastening the line wire to the insulator.

Fourthly. The protection of the insulator by means of a sheet iron shield clamped into position by means of the last mentioned screw-clamp binding.

A.D. 1872, January 13.—No. 110.

SWINBURN, John Field, of Birmingham, in the county of Warwick, gun manufacturer.—"Improvements in breech loading small arms."

This invention refers to small arms in which the breech is opened and closed by a hinged falling block.

The block is worked by a lever as usual. The striking pin works in a cylindrical hole in the block, and is withdrawn, on the depression of the lever to open the breech, by means of a cross pin on the head of the lever engaging in a fork at the rear end of the striking pin. The striking pin, when the block is raised, is situated in a line with the axis of the barrel; the motion of the striker is consequently direct and there is little risk of missfire.

The hammer turns on the same centre as the lever, and is cocked, on the depression of the lever to open the breech, by a shoulder on the tumbler engaging with a shoulder on the lever or by a heel piece on the block acting upon the hammer. The hammer is held in its cocked position by a sear taking into a bent in the tumbler, and is urged forward, on releasing the sear, by a mainspring connected with the tumbler. The main spring offers no resistance to the motion of the block to close the breech. The horizontal arm of cranked extractor lever is longer than the vertical arm which acts upon the cartridge case. On the descent of the hinged block, the extreme end of the extractor lever is first acted upon and the empty case started from the barrel; as the block further descends, it strikes against the extractor lever near its centre and ejects the empty case from the gun.

The trigger and guard plate is connected to the gun by the extractor pin and a second cross pin at the rear end of the plate which enters a half hole in the said end of the plate.

A.D. 1872, January 13.—No. 111.

SULLIVAN, John, of the village of Thornton, in the county of Simcoe and province of Ontario, Canada.—"Improvements in apparatus for administering pills."

My invention relates to an improvement in devices for administering pills, and consists essentially of a vessel capable of containing liquid, the said vessel being provided with a spout peculiarly formed as described in the Specification with what is termed a pill-chute placed between the mouth of the spout and the vessel containing the liquid.

A.D. 1872, January 13.—No. 112.

EDGCUMBE, Richard John Frederick, of Stone Hall, Plymouth, in the county of Devon, Lieutenant in Her Majesty's Army, and FITZMAURICE, The Honourable James Terence, of Porthpean, St. Austell, in the county of Cornwall, Commander in the Royal Navy.—"Cartridges for smoking in tobacco "pipes."

This invention has reference to the production of cartridges for smoking in tobacco pipes, for which purpose each charge of manufactured tobacco is encased in a cylindrical or other casing made by preference of tobacco leaf, closed at its end, bound round and provided with a fusee.

A.D. 1872, January 13.—No. 113.

WARREN, Frederic Pelham, of East Court, Cosham, in the county of Hants, Captain in the Royal Navy.—"Improvements in tins, canisters, or cases for containing preserved meats or other substances."

The object of this invention is to enable hermetically sealed tins, canisters, or cases to be readily opened by means of a knife or other similar instrument, for which purpose a part or parts of the tin, canister, or case is or are made of softer material than the remaining part or parts, such softer part or parts consisting of a strip or band, or strips or bands of lead and tin combined by mechanical pressure, or of other suitable soft material capable of being readily cut through, which strip or strips or band or bands of soft material may be combined with the tin or other hard material forming the other part or parts of the tin, canister, or case by soldering or otherwise, preferably before the sheets of tin or other material are cut to the requisite dimensions for making the tin, canister, or case.

A.D. 1872, January 15.—No. 114.

ALLERTON, Richard, of John Street, Adelphi, in the city of Westminster.—"Improvements in feed "apparatus for machines, such as thrashing machines and others requiring the feed or materials of what- "ever kind to be fed or delivered into them with fairly or generally parallel disposition of its or their "several straws or members respectively."

The invention consists in rollers with projections thereon, between which the sheaf of corn or the feed of whatever kind is to be dropped or placed with its straws or members lying generally parallel to them, one or both of the set or of each set of rollers being to be revolved in a direction opposed to the natural fall downwards of the straws or members, and so that the projections on the rollers may serve to unpack or loosen and lay the straws or members and present them to the operation of the threshing or other machine with their generally parallel disposition thereby maintained or improved.

A.D. 1872, January 15.—No. 115.

COWARD, Thomas Richard, of North Brixton, in the county of Surrey, coach smith.—"Improvements "in appliances or apparatus for opening and shutting the heads of landaus and other carriages."

To the cantrail of the carriage, which is hinged to the pillar top, the applicant (by means of a fixed axis secured to said cantrail) attaches free to work in said axis a lever, the other or lower end of which lever is secured (free to work) to a fixed axis, which is secured to the "elbow" in the carriage frame. The lower end of this lever it is preferred to provide with a quadrant projection with a notch which is to work in connexion with a guide, nut, or stud, so as to keep the pillar top in proper position with the pillar when the door is shut, and opposite this quadrant arrangement (to a projecting piece as preferred) the end of a connecting chain or connector is secured, the other end of which is connected to a barrel spring or other similar spring, the barrel being secured to the carriage frame.

A.D. 1872, January 15.—No. 116.

ASTON, James Jones, of 13, Pembroke Gardens, Kensington, in the county of Middlesex, and of the Middle Temple, barrister-at-law, and also a Queen's Counsel of the county Palatine of Lancaster.—"Im- "provements in machinery for propelling vessels on the water."

Improvements on disc plate ring propellers described in Specification to Patent granted to same inventor and dated the 24 day of February, 1870, No. 539, by making the disc plate of the rings of very much less width and weight, and thereby giving greater speed and less costly rings both in their construction and in the power required to drive them.

A.D. 1872, January 15.—No. 117.

FRANCE, William Henry, of Bradford, in the county of York, wool comb maker.—"Improvements in "machinery for combing wool and other fibres."

This invention consists in the application of an additional and outer circle of pins or teeth to the "Noble's comb," having a space betwixt the inner and outer circles of pins, within which space is applied an intersecting comb or combs working within such space and in the direction of the interior of the larger circle, and operating on the wool or fibre, as described in the specifications of Letters Patent granted to H. Rawson and F. Staples, dated the 24th July, 1862, No. 2104, and in the introduction of a knife or knives entering between the teeth of the inner or outer circles of pins or teeth pressing or nipping the wool or fibre upon the leather placed therein, so as to hold the wool or fibre (whilst being "cleared" or cleansed by the intersecting comb or combs), as described in the specification of Letters Patent granted to the aforesaid William Henry France and Thomas Speight, dated the 26th day of October 1868, No. 3276, and in the introduction of reciprocatory feeding boxes for the purpose of delivering the wool to the teeth of the combs at their point of junction, and so dispensing with the feeding plates and apparatus as heretofore employed on this class of machine for such purpose.

A.D. 1872, January 15.—No. 118.

MADDEN, James, of No. 3, Leadenhall Street, in the city of London.—(*A communication from Theodore Bourne, of the city, county, and state of New York, in the United States of America.*)—" Improvements in " cotton gins."

This improved cotton gin consists of a large roller combined with a small roller, also a vibrating plate or stripper, a doctor, and a guard; also a revolving doffer or other equivalent and a guard to shed the seed when the fibres are stripped. The small roller is stayed by rollers or wheels.

A.D. 1872, January 15.—No. 119.

BEVEN, Thomas, of Ward's End, Loughborough, in the county of Leicester, in the employment of the Nottingham Manufacturing Company.—" Improvements in means or apparatus for uniting parts of looped " fabrics."

The object of the invention is to facilitate the uniting together of parts of looped fabrics, and the improvements are particularly applicable to uniting parts of looped fabrics at the selvages.

The selvage edges of looped fabrics have a tendency to curl over to one surface thereof, and whilst it is comparatively easy to lay the selvage loops on to a series of points with one face or surface of the fabric towards such points, it is very difficult to lay the corresponding selvage loops on to such points with the opposite face of the fabric towards them, as is neccessary in uniting two such parts of such fabric together. To remedy this evil the loops of the two parts of fabric to be united together are laid on to separate series of points or holding instruments, and these points or instruments are applied so that the part of fabric on one set may, by suitable " knoking off " means, be transferred therefrom to those of the other, which then holds both in position to receive the uniting thread.

A.D. 1872, January 15.—No. 120.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Sophia Letitia Mercer, of Washington, district of Columbia, United States of America, gentlewoman.*)—" An improved reflector for facilitating the threading of needles."

My invention relates to a reflecting shield, made preferably concave, before which the needle is held to be threaded, so that the light concentrated upon the shield shines brightly and clearly through the eye of the needle while the body of the same appears very dark and distinct against the polished surface behind it.

A.D. 1872, January 15.—No. 121.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from William Radde, of the city and state of New York, United States of America.*)—" Improvements in pipes and pipe-joints for gas, water, and other fluids."

This invention relates to a pipe made of an interior lining of glass or other vitreous material, an intermediate layer of hydraulic cement, or other suitable material, and a protecting case of metal, wood, or other material in such a manner, that a pipe is produced which is durable and free from corrosion. The said invention relates also to an elbow or other joint for connecting two sections of my pipe, the said joint being lined with glass or other vitreous material forming shoulders close behind screw threads which are cut in the ends of the joint ready to receive the pipes.

A.D. 1872, January 15.—No. 122.

SHAW, Henry, brewer, **DITCHFIELD, William**, accountant, and **KNOWLES, John**, machinist, all of Blackburn, in the county of Lancaster.—" Certain improvements in power looms for weaving, and in " apparatus for cutting double pile fabrics and for weaving carpets and other fancy fabrics."

This invention relates,—

First, to fabrics known as velvet or pile work, which is woven with two bodies of cloth, between which is interlaced a second warp forming the pile; and between these two bodies of cloth a rod is introduced at intervals to keep them at equal distances.

The separation of the cloths is performed by a reciprocating knife actuated by tappets and compound levers. The healds are caused to rise and fall by means of double hooks fixed in a suitable framework, to which motion is imparted from one of the shafts of the loom. The picking shafts are actuated by means of an arrangement of chain tappets revolving with the tappet shaft for the purpose of stopping the motion of the shuttle to admit of the pile regulating rod being inserted. The reciprocating knife is kept sharp by passing between stones placed on the slide rail at each side of the cloth.

The second improvement has reference to fabrics known as Kidderminster carpets, and consists in the use of a number of vertical shuttle boxes at each end of batten, which shuttle boxes are actuated by means of tappets and a perforated pattern chain. The picking of the shuttle across the loom is performed by an arrangement of chain tappets revolving with the tappet shaft, by which means any number of shots can be made from one side, which the pattern that is being woven may require.

The third improvement consists in an arrangement for preventing "traps" in fast reed power looms by placing a supplementary frog at one end of the loom and in front of the batten. A suitable finger is placed on the protecting rod for the purpose of taking hold of the supplementary frog when the shuttle has failed to arrive at its destination, and so prevent the wings of protecting rod from slipping over the ordinary frog, which will protect warp threads from damage.

A.D. 1872, January 16.—No. 123.

COOKE, Henry, of Sheffield, in the county of York.—"Improvements in the manufacture of finished "iron applicable for ship, boiler, tank, and other plates, and merchant bars."

The object of this invention is to produce finished iron from Bessemer steel rail ends and puddled iron bars.

A pile is to be made of alternate layers of the steel and iron, which being heated is rolled to form plates and other description of finished iron, the carbon of steel uniting with the iron and perfecting the union of both.

The bars may be piled longitudinally or transversely until sufficient dimension is acquired. Bessemer scrap and iron scrap may also be used.

A.D. 1872, January 16.—No. 124.

WORTH, Albert Ratcliffe, of Rochdale, in the county of Lancaster, manufacturer.—"Improvements "applicable to machinery for preparing, spinning, and doubling cotton, and other fibrous materials."

This invention relates, firstly, to the guide wires or plates for conducting the material to the rollers—Secondly, to keeping the traversing rod in contact with the excentric—Thirdly, to the washer patented by Worth and Spencer, August 13th, 1858, No. 1851.

A.D. 1872, January 16.—No. 125.

PARAIRE, Edward Louis, of Mornington Crescent, Regent's Park, in the county of Middlesex, architect and civil engineer.—"Air pumps for the compression of air by the medium of water."

The object of the invention is to avoid the production of heat consequent on the compression of air.

A.D. 1872, January 16.—No. 126.

PARAIRE, Edward Louis, of Mornington Crescent, Regent's Park, in the county of Middlesex, architect and civil engineer.—"Improvements in looms for weaving."

The object of the invention is to open by impact the valves or other contrivances in looms in which the shuttle is thrown by the agency of compressed air.

A.D. 1872, January 16.—No. 127.

DEE, Henry William, of the firm of H. W. and L. Dee, of Sherwood Street, in the county of Middlesex, manufacturers.—"An improvement in cigar cases and other like articles, and in fastenings for the same, which fastenings are also applicable to other purposes."

The cigar cases or other articles have a fastening at each side, or top and bottom, so that a person can open whatever side comes ready to the hand, while the other fastening will act as a hinge. An improved fastening for the purpose composed of spring bolts, tubular catches and releasing pistons is described.

A.D. 1872, January 16.—No. 128.

LEE, Alfred, of Hyde, in the county of Chester.—" Improvements in apparatus to be applied to pipes " used for heating buildings by steam."

This invention is designed to be applied to steam pipes used for heating buildings for the purpose of clearing the pipes from the water of condensation, and at the same time to prevent the steam from entering the return pipe when shut off from the flow pipe as frequently happens with the arrangement hitherto adopted.

The invention consists principally in the application to the said pipes of a back pressure valve (or valves), that is to say, a valve which is self-acting and opens only in one direction, so that it can open by the pressure of the column of water to allow it to flow out of the pipes, but it will close itself against the admission of steam or hot water in the reverse direction as soon as the tap or valve of the flow pipe is closed.

A.D. 1872, January 16.—No. 129.

WILSON, George Henry, of 42, Ebenezer Cottages, Warner Road, Camberwell, in the county of Surrey. —" Improved self acting safety appliances for fire-arms."

A double ended lever or bracket is pinned in the lock and is acted upon by a spring to keep one end of it in contact with the tumbler, so that the end can enter the notch or bent when the arm is cocked, the other end being free to be acted upon by a spring lever in the "small" of the " butt" when the firer grips the gun to discharge it. In some cases a rod passing through the stock to the heel plate is used, which rod can be pushed in by the pressure against the shoulder to release the tumbler lever.

Again in some cases the tumbler lever has a leg on it to grip the main spring.

A.D. 1872, January 16.—No. 130.

DAVIS, William, of 25, Lancaster Road, Great Yarmouth, in the county of Norfolk, engineer.—" An " improved selfacting vent peg or valve."

The peg has a perforated top and is provided with a valve for pressing against the apertures under the action of a spring encircling its stem, the upper part of the stem is threaded for a threaded nut to be adjusted according to the quality or density of the liquid, and the amount of air necessary to be admitted to the vessel at each draw off.

A.D. 1872, January 16.—No. 131.

GREENHILL, John Hayton, of Belfast, in the county of Antrim, in Ireland, miller.—" Improvements in " disintegrating machinery."

This invention consists in the use of two or more discs, drums, naves, pulleys, or wheels, furnished with either plane or transversely or obliquely corrugated, fluted, gouged, ribbed, rippled, toothed, or otherwise roughened radial bars, blades, pins, ribs, snugs, or spokes, the faces whereof would form oblique angles with the plane of such discs, drums, naves, pulleys, or wheels.

A.D. 1872, January 16.—No. 132.

WHITTAKER, George, of Breightmet, near Bolton, in the county of Lancaster, bleacher and finisher.— " Improvements in machinery and apparatus for damping fabrics."

My invention consists in so arranging the brushes and guiding the fabric that both sides of the fabric may be damped simultaneously, whereas hitherto it has required two operations to effect the same.

A.D. 1872, January 16.—No. 133.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Zenas Coleman Robbins, of Washington, district of Columbia, United States of America.*)—" An improved horse-collar."

My improved horse-collar consists of two properly shaped wooden side sections pivoted to a properly shaped top section, and otherwise connected to each other in such a manner that the said collar can be readily adjusted to different shapes and sizes.

A.D. 1872, January 16.—No. 134.

NODDINGS, Richard, of Cowley, in the county of Oxford, steam plough proprietor.—" Improvements " in wheeled ploughs."

This Provisional Specification describes improvements on the ploughs known as "Pirie's"; moveable stilts are employed to depress the land wheel and sole plate; also an arrangement is described for steering by means of the leading furrow wheel.

A.D. 1872, January 16.—No. 135.

PAGE, George Gordon, of Gray's Inn, in the county of Middlesex, civil engineer.—"Improvements in "the construction of piers and breakwaters."

This invention consists in constructing piers of a principal jetty running out from the shore to deep water, and terminating in a pier head or platform. From the pier head or platform two or more subsidiary piers, straight or curved, radiate in different directions so as to form harbours within which vessels may always lie in safety. Railways may be made upon the piers and platform, which are constructed so that the water may pass through the supports on which they rest, so as to prevent silting up. Upon the pier head or platform elevated buildings may be erected serving as marine promenades.

Trains may be run from the piers onto or from the decks of suitable vessels, and sometimes locks or basins having gates are formed in the piers themselves, into which vessels are admitted, and are then raised or lowered to the level of the railways by admitting water from the sea or from suitable land reservoirs, or by discharging it as required.

A.D. 1872, January 17.—No. 136.

HOWSON, Richard, of Middlesbrough-on-Tees, in the county of York, engineer, and **THOMAS, John James**, of the same place, ironworks manager.—"Improvements in puddling furnaces."

The invention relates to furnaces revolving on trunnions, and to means for preventing the "in rush" of air at the joints between the revolving furnace and the two flues, and consists in forming an annular cavity round the joint or joints, and connecting such cavity or cavities with any suitable draught, or the draught to the furnace chimney, so that the in rush of air will be counteracted or neutralized.

A.D. 1872, January 17.—No. 137.

MACINTOSH, John, of Regent's Park, and **BOGGETT, William**, of Chelsea, both in the county of Middlesex.—"Improvements in the construction of hollow vessels of india-rubber, applicable to the manu- "facture of air and water beds or cushions, and articles for applying heat and cold, and for protection "against solar rays; such hollow vessels being also applicable as dress improvers or for holding liquids for "drinking and other purposes."

The object of this invention is, firstly, to prepare hollow vessels of a globular or other suitable shape, composed of india-rubber (expanded as described in the Specification of a Patent granted to the said applicants, dated 6th May, 1871, No. 1226), and enclose them in lengths of elastic tubular webbing, being filled with air or water: these lengths are converted into beds or cushions by interweaving or otherwise, sometimes connecting the vessels in each length together so that they can all be filled or emptied through a single valve.

Secondly, to make use of similar vessels or tubes inflated with air, and enclosed in any light textile material, as a means of protecting the human head from solar heat.

Thirdly, in applying vessels of a like description as improvers of ladies dresses commonly called bustles.

Fourthly, in the use of similar vessels or tubes (protected by elastic webbing and filled with hot water) as a means of applying heat for warming beds, or other purposes; also for applying cold when filled with ice; and likewise for containing liquids for drinking and other purposes.

The efficiency, cheapness, portability, and lightness of such vessels renders them especially suitable for the above-mentioned objects.

A.D. 1872, January 17.—No. 138.

SPENCE, William, of 8, Quality Court, Chancery Lane, in the county of Middlesex, patent agent.— (*A communication from Frederick Oakley, of the city of Toronto, Canada, carpenter.*)—"Improvements in the "joints of the permanent way of railways."

In order to provide for expansion and contraction one of the fish-plates is on the outer face tapered from the centre to the ends, or formed with two inclined planes at the parts where the fastening bolts are inserted with, in either case, a flange at the top and bottom of the said tapered part or the said inclined planes.

Wedges are applied to the tapered or inclined part or parts of the plate between the flanges and are covered by the fastening nuts.

The bolt holes in the rails and wedges are circular to fit the bolts, but in the fish-plates they are elongated or slotted.

A.D. 1872, January 17.—No. 139.

MORE, John Walter, of Market Street, Finsbury, and **NORMAN, John**, of Hoxton Square, both in the county of Middlesex.—" Improvements in means or apparatus for clipping horses and other animals."

For this purpose instead of operating the moveable comb direct by a lever handle having a pin working in a slot or opening therein as heretofore, such lever handle is connected to one end of a link the other end of which is pin jointed to the upper or moveable comb.

A.D. 1872, January 17.—No. 140.

MORFIT, Campbell, of Baltimore, state of Maryland, United States of America, chemist, but at present of 35, Southampton Buildings, in the county of Middlesex.—" Improvements in the method of refining fat " oils, and more particularly the crude oil of cotton seed."

The invention has for its object the purification of crude fat oils by fractional treatments with lime and soda, so as, firstly, to separate the pigmentary and viscous matters; and, secondly, to divide the oily portion thus refined into acid and neutral products.

A.D. 1872, January 17.—No. 141.

WEEKS, John Wills, of 40, Havering Street, Commercial Road, in the county of Middlesex, master mariner.—" An improved composition for coating heated surfaces, either wood or iron, also an anti- " corrosive, and prevention of deposits on iron ships' bottoms."

The prevention of corrosion of iron surfaces when exposed to water and external influences, and blistering and scaling when exposed to heat; also applicable to wooden surfaces, and iron ships' bottoms generally.

A.D. 1872, January 17.—No. 142.

NEWELL, Lorenzo Dow, merchant, of 514, Broadway, New York, in the United States of America, at present residing at the Castle and Falcon, Aldersgate Street, in the city of London.—" A new marine state " room."

I make use of a cylindrical chamber or room, suspended horizontally on board a ship on proper points; and inside this drum I suspend equally one or more berths or sofas with their axis of suspension at right angles with that of the drum. In order to balance such berth, I make use of a sliding weight suspended to the same, and which can be moved easily by the occupants.

I provide the drum with an appropriate door, windows, and curtains, which prevents the unpleasant sight of the rolling of the ship. In order to render the room stationary when desired, I make use of a bolt passing through its bottom into the framing of the ship, where it is screwed to render it temporarily stationary whilst a passenger is entering or leaving the same. I make use of a moveable footstep, which, actuated by the party resting on the same, throws out laterally two rods that press against the fixed partition of the ship and act the part of a brake.

For the purpose of ventilation, I avail myself of the oscillation of the drum to actuate a bellows or other appropriate blowing instrument, which draws fresh air from without and blows it into said drum or the compartment within which it is suspended.

A.D. 1872, January 17.—No. 143.

CRANSTON, John Grey, of Low Byer, Alston, in the county of Cumberland.—" Improvements in " apparatus for holding rock drills in mines and tunnels."

This invention consists of a trolly on four wheels with a moveable support, which is actuated horizontally across the trolly and the face of the drift by means of a screw. The hollow bar or stretcher which fixes the carriage when it is in position for work is held by the before mentioned moveable support, and fixes itself by means of a screw at the bottom. To this hollow shaft or stretcher the drill is attached. The drill is raised or lowered by means of a lever, having for its fulcrum a pin in either of the holes in the bar attached to the moveable support at its bottom end and to the hollow bar at its top end; when the drill is fixed in position this bar is allowed to fall back by the removal of the pin at the top which connects it to the hollow shaft.

A.D. 1872, January 17.—No. 144.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Joseph Wellington Frazier, of the city, county, and state of New York, United States of America.*)—"Improvements in cartridge boxes and knapsacks."

The first part of this invention consists of a cartridge box, to the body of which a lid is hung, so as to require no such effort on the part of the soldier to keep the box open as the flap of an ordinary cartridge box demands. The second part of the invention of a knapsack and cartridge blocks relatively constructed so as to enable a soldier to carry into action an extra supply of ammunition without inconveniently loading his cartridge [*box**]. Also of cartridge blocks hinged together so that they can be readily folded for adjustment in a cartridge box and as readily unfolded for adjustment in the knapsack.

A.D. 1872, January 17.—No. 145.

McDOUGALL, Arthur, of the firm of McDougall Brothers, manufacturing chemists, Manchester and London.—"Improvements in the manufacture of sulphuric acid."

My invention consists in causing the sulphurous gas, after leaving the kilns or burners, to bubble through an aqueous solution.

This may be readily effected by either pumps or fans.

A.D. 1872, January 17.—No. 146.

SIMPSON, Samuel, of Tottenham Court Road, in the county of Middlesex, builder.—"Improvements "in water closets."

The object of this invention is to prevent the escape of noxious effluvia from the soil pipes of water closets through the pan or closet apparatus into the house. This is effected by an arrangement of pipes that will prevent the difference of pressure in the pan or trap to that existing in the soil pipe.

A.D. 1872, January 17.—No. 147.

MACK, Charles Henry, of Portland, Multnomah county, state of Oregon, United States of America.—"An improvement in artificial teeth."

My invention consists in providing an artificial crown with an undercut or dovetailed mortise, by means of which it is secured to the natural root. I first fill the nerve cavity in the root with gold or other appropriate filling, and then at the anterior and posterior side of the filling I drill into the solid dentine a hole for the admission of pins upon which are cut screw threads. The pins are then firmly secured in the holes. I now fill the undercut with a fusible metal, one that will fuse at a low temperature, and while yet soft I press the crown firmly over the pins.

A.D. 1872, January 17.—No. 148.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Benjamin Rowland Croasdale, of Philadelphia, Pennsylvania, United States of America.*)—"An improved bag for containing guano phosphates and ores."

This invention consists in a bag made of a textile fabric so prepared that it is not attacked by the acids contained in guanos and phosphates, or worn out by the attrition of the fragments of ore. Therefore much of the loss from evaporation of the ammonia of guanos and much if not all siftage of the guanos, phosphates, ores, or other substances contained in the bags is obviated.

A.D. 1872, January 17.—No. 149.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Henry Vander Weyde, of the city, county, and state of New York, United States of America.*)—"Improvements in applying colors or tints to photographs, albumenized, and other surfaces."

The purpose of the invention is twofold, viz.; 1st. To produce stippled tints of any shade or color over the backgrounds and other parts of photographs, albumenized, and other surfaces by rubbing dry colors or tints and fine powdered pumice stone or its equivalent thereon until it adheres. 2ndly. To fixing dry colors or tints on albumenized or glossy surfaces by the same means.

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* The word "box" is found in the copy of the Abridgment delivered by the Applicant, but does not appear in the original Abridgment.

A.D. 1872, January 18.—No. 150.

KEELING, Enoch Bassett, of No. 1, Verulam Buildings, Gray's Inn, in the county of Middlesex, architect.—"Certain improvements in signal lamps."

The improvements in signal lamps, the subject of this invention, consist:—

In the production of colored lights by the mixing of two or more lights of colors other than that required, also in the production of any required color by the use of sheets or lenses, or a sheet or lens of colored glass inside the lantern, so as to cause a colored light to be seen through a colorless lens, and in the use of a sheet or sheets, or a lens or lenses of colored glass inside the lantern, so as to alter or improve the color of an outer colored lens. The sources of light are so placed as to be invisible from the outside of the lantern when looking through the outer lens in any direction, the light not being direct, but reflected; the reflectors are of a suitable form for mixing two or more colored lights, for securing brilliance and even texture of light when the outer lens is used as the medium of color, and for securing the absence of any visible centre of light; the sources of light, and consequently the products of combustion are isolated and shut off from the major part of the reflecting surfaces and the outer lens by which the light is intensified and directed.

A.D. 1872, January 18.—No. 151.

DICEY, William Thomas Young, of Park House, Walmer, in the county of Kent.—"Improvements "in the construction of steam vessels and sailing vessels."

This invention relates to certain improvements in the construction of steam and sailing vessels, by means of which their tendency to pitch or roll is very much lessened, and to a considerable degree prevented, and thereby the causes of sea sickness, so far as they are occasioned by violent motion of the vessel, are wholly or partially removed.

A.D. 1872, January 18.—No. 152.

BLUMBERG, Franz, of Martin's Lane, Cannon Street, in the city of London, merchant.—(*A communication from Thomas Greenhill, of Vienna, in the Empire of Austria.*)—"Improvements in the construction of "wheel carriages."

The object of this invention is to dispense with the use of the ordinary axletrees, and to use in place thereof a strong iron frame, on and in which the body of the vehicle or cabriolet is suspended on springs, at 3 separate points.

A.D. 1872, January 18.—No. 153.

PIEPER, Carl, of Dresden, in the Kingdom of Saxony, civil engineer.—"Improvements in channel "communications, the mode of towing and hauling vessels, and in the machinery employed therein."

The use of two or more chains or ropes laid along the beds of rivers or across channels, and so connected with vessels as to be used as towing and hauling lines, some of them acting simply as guides or "anchors" for the purpose of steadying the said vessels and preventing or lessening their rolling and pitching in rough water.

The application to hauling or guiding or "anchoring chains or ropes of apparatus for securing the ends of such chains or ropes in case of breakage.

A.D. 1872, January 18.—No. 154.

STOCKER, Alexander Southwood, of Horsleydown, London.—"Improvements in the application, "construction, manufacture, and combination of articles appertaining to infants' feeding bottles and other "receptacles, and in the machinery, apparatus, process, and means to be employed in producing and "finishing the same, part of which process is applicable to the production of other articles."

Producing the appendages employed with feeding & other bottles, by composing them of glass, porcelain, india rubber, cork, or such like material, & compounding them in such manner as to form peculiar fittings, chiefly producing them by the aid of dies & pressure.

A.D. 1872, January 18.—No. 155.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Wilhelm Rudolph Proell, of Aix-la-Chapelle, in the Kingdom of Prussia.*)—"Improvements in governors."

This invention relates to the construction of governors with short radii, so as to obtain in small compass and at small cost the effect of governors having long radii, which result is attained by fixing the balls on the upper free ends of the lower radii or links jointed to the sliding collar.

A.D. 1872, January 18.—No. 156.

STOKES, Lemster, and STOKES, William, both of Derby, in the county of Derby, elastic web manufacturers.—"Improvements in weaving loom shuttles and an improved method in fixing and driving the "same."

These improvements consist in the shuttle working in a perpendicular attitude at the top of the lathe, whereas heretofore the shuttle has been worked horizontally at the front of the lathe. These improvements allow of the employment of a smaller shuttle at the same time carrying a quill three-fourths larger than the quill heretofore used.

A.D. 1872, January 18.—No. 157.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Edward F. Benton, of Buffalo, New York, United States of America.*)—"Improvements in bronzing machines."

My invention has for its object to render the operation of bronzing complete in all its details, and to prevent the waste of the bronze material. The operative, standing in front of the feed board, feeds the sheet under a griper clamping the sheet against a rubber bed on the periphery of the cylinder. The sheet having been previously sized is carried under a bronze roller which receives its supply from a hopper, and has it evenly spread on its periphery by four spreading rollers. It is then carried under an upper wiping or cleaning roller and is slowly and surely wiped and polished. All the superfluous bronze is carried up on the periphery of the cleaning roller, in a direction reverse to that of the cylinder's motion, and is brushed from the cleaning roller by a rapidly revolving brush. The sheet then passes down to a lower or auxiliary cleaning brush; a simple comb is used for cleaning this brush. The sheet is then carried around until the griper is opened, and then dropped upon a skeleton apron and carried along and deposited in a receiver.

A.D. 1872, January 18.—No. 158.

DEE, Henry William, of the firm of H. W. and L. Dee, of Sherwood Street, in the county of Middlesex, manufacturers.—"An improved combined fastening and hinge for cigar cases and other like articles."

Combined fastenings and hinges are used in such cigar cases or other like articles as have two fastenings, one at each side (or top and bottom) of the frame, so that either side can be opened, while the fastening at the other side acts as a hinge.

The improved combined fastening and hinge which constitutes this invention consists of a narrow plate hinged to one half of the frame of the case, and of a corresponding fixed plate on the other half of the frame under which the hinged plate takes when the frame is closed. A clasp is hinged to the hinged plate and clasps the opposite half of the frame. When either of these combined fastenings and hinges is opened, the hinged plate of the opposite fastening remains under its corresponding fixed plate and acts as a hinge, the hinged plate and clasp forming the necessary joint and connection.

A.D. 1872, January 18.—No. 159.

BRADBURN, William, of the firm of "Bradburn and Co.," of Wednesfield, near Wolverhampton, in the county of Stafford, manufacturing chemists.—"Improvements in annealing cast iron."

The inventor uses lime, either alone or mixed with other materials used in the annealing of cast iron, and imbeds the cast iron to be annealed in the said lime or mixture, in the same manner as cast iron is imbedded in the materials now used for annealing it.

And the inventor uses, secondly, nitre or nitres mixed with the said lime or mixture or with other materials used in the annealing of cast iron, and in such proportion as the quality of the iron to be annealed may require.

A.D. 1872, January 18.—No. 160.

DEE, Henry William, of the firm of H. W. and L. Dee, of Sherwood Street, in the county of Middlesex, manufacturers.—"An improved fastening for cigar cases, hand bags or other articles."

The invention refers to those fastenings which are opened by pressing upon a spring plate, and its object is to construct a fastening of this nature in such manner that it can be conveniently opened or released, whichever end of the cigar case or other article happens to present itself. For this purpose the fastening is made with two spring plates pointing respectively towards the two ends of the frame of the cigar case or other article. The fastening can be opened by pressing upon either of these spring plates.

A.D. 1872, January 18.—No. 161.

GAMBLE, Robert, of 2, West Terrace, Tredegar Road, Bow, in the county of Middlesex.—" Improve-" ments in the manufacture of corsets and stays."

My invention consists in obviating the necessity of tying or lacing and doing away altogether with the opening at the back, and I carry this into effect by the following means,—

The stay or corset is made without any opening in the back, but is fastened in front by means of a broad busk with three slits, which allows the top sliding steel to close an inch or more after the corset or stay is put on, the fit is effected by means of three studs running into the slits, and so arranged as to close up as tight as the wearer may desire.

A.D. 1872, January 18.—No. 162.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from William Morris, of Philadelphia, Pennsylvania, United States of America.*) —" An improved process of waterproofing leather, paper, textile fabrics, felt, cordage, and other like " substances and compounds to be used therefor."

My process consists of two steps or parts as follows :—For the first part I use a chemical compound which consists of, say, one part of dry gelatine (isinglass or the like) dissolved in, say, four parts of oil, including a small quantity of sulphuric or other acid ; when these are combined by means of heat, five parts (or thereabouts) of an alkaline solution are added at a specific gravity of about 26° Baumé, the whole being stirred while yet warm. I designate this my " preparatory compound. For the second part of my process I use a chemical compound which I designate my " perfecting compound," and which is prepared as follows :—In one vessel I prepare a strong solution of one of the alums. In another vessel I prepare a solution of the sulphate of zinc, and in a third vessel a solution of the acetate of lead. When prepared, the two sulphate solutions are mixed, and to these are added acetate of lead solution. By the chemical action that ensues, sulphate of lead is formed : when this has subsided the clear liquid is drawn off. My " preparatory compound " dissolved in hot water. To treat leather I steep it in this bath and then drain it. When the goods have been removed from the " preparatory bath " and are well drained I steep them in a bath of my " perfecting compound ;" when well drained they are gradually dried.

A.D. 1872, January 18.—No. 163.

LAKE, William Robert, of the firm of Haseltine, Lake & Co., patent agents, Southampton Buildings, London.—(*A communication from Albert Francis Allen, of Providence, Rhode Island, United States of America.*)—" Improvements in relief-valves and apparatus connected therewith, chiefly designed for fire-" engines, force pumps, and hydrants."

My invention consists partly in combining a relief valve with a hydraulic lever in such a manner that; first, the relief valve will be kept closed by the current of water acting upon the lever; and, second, the relief valve will be free to open simultaneously if the current of water should be checked. The said invention further consists in combining with such an apparatus a signal bell, by means of which a system of communication may be established between the hose-man at the end of the line of hose and the person in charge of the fire engine, pump, or hydrant.

A.D. 1872, January 18.—No. 164.

ASHBERRY, Philip Henry, of Sheffield in the county of York.—" Improvements in machinery or " apparatus for casting articles in tin, lead, or other similar metals or alloys."

This machine is for the purpose of casting articles of tin, lead, &c., larger, thinner, harder, and the ornamentation more sharply defined than is effected by the ordinary process of casting such metals.

The improvements on the Patent No. 740, '66 are as follows :

1. The moulds are fixed and the pan is moveable.

2. The arrangement for opening and closing the moulds by means of a loop or link on the sliding shaft worked by the crank pin on the driving shaft.

3. The oscillation of the pan to and from the moulds by means of levers and rods connected with the crank of the driving shaft.

4. The manner of working the valves or openings in connection with the force pump by means of a rod having a valve block which is actuated through suitable levers by a cam and spring.

5. The " bit " or conductor between the exit from the pan and the entrance to the moulds.

6. The mode of raising the lever of the force pump by the crank or driving shaft.

7. The catch retaining the lever of the force pump and the rod actuated by a spring to knock it away (this is the same spring mentioned in clause No. 4.

8. The mode of stopping the machine, when the moulds are either open or closed, by means of a weight which is raised by a cam on a driving shaft and is allowed to fall at the proper time on the end of a lever which throws the clutch box out of gear.

9. The manner of weighting and stopping the lever of the force pump by means of a double ended lever, one end of which carries the weight and is connected with the lever of the force pump, and the other end working in guides may be stopped at different points by a pin or other appliance.

A.D. 1872, January 18.—No. 165.

COCKILL, John, of Robert Town, in the county of York, currier, **SHAW, Thomas**, and **KIER, John**, of Brighouse, in the same county, machinists, and **CRAVEN, John**, of Brighouse aforesaid, woollen manufacturer.—"Improvements in machinery or apparatus for scouring and setting hides, butts, or other "kinds of leather."

The inventors employ a rotating drum or cylinder with a series of knives fixed thereon, and also a series of brushes. A rotating roller covered with india rubber or other flexible material is mounted on a swing frame underneath said cylinder, and the roller is pressed against the cylinder by suitable means. The roller is removed from contact with the cylinder by means of a foot lever.

A moveable table is supported upon friction rollers carried on the framework, its upper surface being level with the point of conjunction of the cylinder and roller, and having a slot hole therein for the upper part of the roller to pass through and to allow the table to be moved as desired.

The table is provided with either an eccentric shaft or a bar and screws or other suitable contrivance for readily fixing a hide thereon, so as to be thereby drawn in betwixt the roller and the cylinder and operated upon by the knives or scrapers and brushes, which straighten and scour the same whilst passing.

A.D. 1872, January 18.—No. 166.

WALKER, Henry, of Greetland, in the parish of Halifax, in the county of York, gentleman.—(*A communication from Thomas Sugden, of the firm of King and Sugden, iron founders, Bombay.*)—"Improvements "in cotton gins."

This invention relates to improved machinery for ginning cotton, and consists in the application to such machinery of a roller, on the periphery of which are spiral vanes or blades extending longitudinally from right to left and from left to right, acting in conjunction with a fixed knife, so as to feed and rub off the seeds from the cotton.

A.D. 1872, January 18.—No. 167.

OLDROYD, John, and **OLDROYD, Mark**, junior, of the firm of Mark Oldroyd & Sons, of Dewsbury, in the county of York, woollen manufacturers.—"A new or improved textile fabric."

This invention consists in reducing old bags, sacks, sheets, or fabrics to a fibrous substance by similar means or machinery as that now employed in reducing old woollen fabrics to "shoddy," then spinning the same into yarn, and using the yarn for weft to weave along with cotton warp, or warp made of hemp or other fibrous substance, whereby we produce a cheap textile fabric which may be used for various purposes.

A.D. 1872, January 18.—No. 168.

COATES, James Calvert, and **MAY, Daniel**, of Oat Lane, in the city of London, manufacturers.—"Improvements in neck-ties and scarves."

This relates to the manufacture of neck-ties and scarves with two knots or fold-over ends for making the same reversible, the band being removable and capable of attachment by fasteners.

A.D. 1872, January 18.—No. 169.

LAKE, William Robert, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Campbell, of Brooklyn, New York, United States of America.*)—"Improvements in printing presses."

The principal object of the said invention is to render the machine self acting through the agency of the sheet, to such an extent that a sheet improperly fed or registered will pass through the machine without being printed and be deposited in a misplaced position in the pile, so as to be readily distinguished and removed therefrom, while the supply of ink to the form is stopped and the cylinder kept from contact therewith during such improper feeding and the counting mechanism prevented from recording any except the printed sheets. I combine with a printing press an air-pump and suction air-passage provided with a diaphragm, which actuates a coupling when a sheet properly fed closes one or more branch air passages, which causes the printing cylinder to be depressed for making an impression; while the coupling remains, disengaged and the cylinder elevated when a sheet is improperly fed. A second diaphragm at the end of this air passage operates a fly-coupling and releases the fly when a sheet passes through the machine. The fountain supplies ink only when a sheet is properly fed so as to be printed. I use a sheet counter whereby only the printed sheets are counted. I combine with the pneumatic apparatus an electro-magnetic apparatus which permits the action of the pneumatic apparatus only when a sheet is properly registered, and permits the pneumatic coupling to discharge improperly fed or unprinted sheets. I use two sets of form and distributing rollers for supplying ink to the form from both ends whereby an even inking is insured, and I provide means for adjusting the form and distributing rollers, whereby the wiping action of the form-roller on the form, which results from an imperfect adjustment, is prevented. I also provide mechanism for actuating the bed and carriage, whereby that tremulous movement of the bed is prevented, and the consequent wear of the type.

A.D. 1872, January 18.—No. 170.

DYNE, William, and DYNE, Thomas Reed, both of No. 12, Bishopsgate Street Without, in the city of London.—"Improvements in the mode of and arrangements for cleansing street pavements or ways.

This invention relates to the cleansing of pavements or ways by jets or streams of water projected on to the pavement or way through series of orifices or nozzles, for which purpose a pipe or pipes, formed or provided with a number of orifices, slits, openings, or nozzles, is or are laid along the pavement or way, and in conjunction with such pipe or pipes is or are a connecting pipe or connecting pipes provided with a suitable valve or tap or valves or taps, and communicating with a cistern, reservoir, or main.

A.D. 1872, January 19.—No. 171.

WHITWELL, Thomas, of Thornaby Iron Works, Stockton-on-Tees, in the county of Durham.—"Improvements in apparatus for heating air and gases."

This Provisional Specification describes improvements in the construction of air heating ovens, of the class referred to in the Patent No. 2897, 1865. They are made of cylindrical or elliptical walls, with longitudinal supporting walls. Passages are provided in which the air to support combustion may circulate and become heated, and cleaning doors in the bottom are provided.

A.D. 1872, January 19.—No. 172.

ROLLASON, William, of Birmingham, in the county of Warwick, tin plate worker, and **BROUGH, Nehemiah**, of the same place, tool maker.—"Improvements in boxes for matches and other articles."

The metal of which the box is constructed is so arranged that it serves as a spring both to cause the lid to spring open when liberated and also to retain it when closed.

A.D. 1872, January 19.—No. 173.

GRANTHAM, John, of King's Arm Yard, in the city of London, civil engineer.—"Improvements in tramway carriages."

This invention consists of arrangements by which the steam carriage for tramways, for which a Patent was granted on the 28th day of July 1871, No. 1991, may be adapted to run on asphalte and common roads, the same apparatus being also applicable to tramway carriages worked by horses.

A.D. 1872, January 19.—No. 174.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Jean Adrien de Mestre, a person resident at Paris, Rue du Port Mahon, merchant.*)—"A new and improved means for securing corks or substitutes for corks in the mouths of bottles and such-like vessels, whether earthenware, stoneware, or glass."

This invention relates to a wire slot cap and to special means of ligature, by which corks or substitutes for corks are secured in the mouths of bottles, and such like vessels, designed to contain gaseous or fermented liquids; and consists of one single piece of steel, iron, copper, or brass wire of a convenient length forming a netting, which wraps up the top face of the cork or substitutes for corks and the top end of the neck of the bottle or such like vessel.

A.D. 1872, January 19.—No. 175.

JENKINSON, John, and DICKSON, Alfred, both of Leicester, in the county of Leicester, pressed leather manufacturers.—"Improvements in the manufacture of compressed leather."

This invention consists in treating untanned fleshing pieces cut from hides or skins with bisulphide of carbon, or carbonic di-sulphide, for the extraction of grease, and in some cases with bi-chromate of potass or potassic di-chromate, in order to render the gelatine in the fleshing pieces insoluble. The compressed leather is manufactured from the fleshing pieces so treated, by means of pressure as well known and understood.

A.D. 1872, January 19.—No. 176.

WALTON, William, of Haughton Dale Works, Denton, near the city of Manchester, wire card manufacturer.—" Improvements in coating or preparing the surfaces of cylinders or rollers used in carding cotton " and other fibrous substances."

My invention consists in coating or preparing the surfaces of cylinders or rollers with a thin sheet of india rubber or any suitable compound of india rubber, or woven fabric combined with india rubber, in order to produce an elastic ground on which the card fillet rests.

A.D. 1872, January 19.—No. 177.

AYRE, Algernon Sydney, of High Street, Kingston upon Hull.—" Improvements in apparatus to " facilitate the weighing of corn and other grain."

The vessel or receiver for the respective quantities to be weighed is suspended upon one end of a lever arm or balance, the other end of which is provided with the counterbalance weight or equivalent of quantity, and until filled, this vessel or receiver rests under or against a passage for the flow of the matter to be weighed from a chamber above.

This passage is opened by a moving cover therefrom, so that, as soon as this vessel or receiver becomes filled to an extent such that the weight thereof is greater than that of the counterbalance weight, the vessel or receiver begins to descend or move away from the supply passage, when a catch which held the cover of that passage open is released and a spring or springs, or it may be weight, then at once closes that cover over the passage and stops the supply.

The bottom of the vessel or receiver is formed by preference of two inclined surfaces, which are moveable and held close by jointed bars. One end of each of these jointed bars is connected to a part of or a projection from the vessel or receiver, whilst the other end of it is connected to the part to be opened. In the descent of the vessel or receiver these jointed bars come each against a fixed bar or projection, by which the two parts thereof are caused to turn upon their joints and the bottom is opened, by which the contents of the vessel or receiver become at once delivered therefrom, when the counterbalance weight causes the return of the empty vessel or receiver back again into a position to be refilled, the jointed bars at the same time coming against another or other bar or stop, by which the rigidity of those bars is restored and the bottom of the vessel is closed. The cover to the supply passage may then be again opened by an attendant, or such opening may be effected by the action of a driver or such like means, operated by an eccentric, crank pin or otherwise.

The respective movements of the balance lever by tooth and ratchet or such like means give motion to index apparatus by which to register the number of discharges from the weighing vessel or receiver.

A.D. 1872, January 19.—No. 178.

DOUDNEY, David Alfred, of Bedminster, in the county of Somerset, clerk in holy orders, and **ADAMS Henry Ogden**, of Birmingham, in the county of Warwick, merchant.—" A self acting disinfectant or " perfuming apparatus for the handles of walking sticks, whips, umbrellas, parasols, and other like articles " generally used or carried in the hands."

The novelty of this invention consists in making or fitting a hollow receptacle for holding camphor or other disinfectant or perfume, and the adapting of such receptacle to the handles or mounts of walking sticks, riding whips, umbrellas, parasols, or other portable personal appendages adapted for the hand.

A.D. 1872, January 19.—No. 179.

HUGHES, Edward Thomas, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London. —(*A communication from Francis Gordon Bates, of Springfield, county of Hampden and state of Massachusetts, Rufus Baker, of Middletown, county of Middlesex and state of Connecticut, and Peter Ferguson, of New Haven, county of New Haven and state of Connecticut, United States of America.*)—" Mechanical clutch to " be used for converting rotary to reciprocating motion for friction brakes and for other purposes."

This invention relates to a frictional device, which, when employed as a clutch, engages the loose pulley with the shaft on which they run, and is also similarly applied as a brake, and also adapted to converting rotary to reciprocating motion; and consists in the arrangement of a divided ring within a rim or cylinder; the said ring provided with a means for expansion whereby sufficient friction will be produced to engage the two, so that the said ring will act as a brake on the said cylinder, power being applied to revolve the cylinder, the ring being stationary, or the ring partially rotating while expanded, returning when contracted, that is a reciprocating movement will impart a rotary motion to the cylinder with which it engages.

A.D. 1872, January 19.—No. 180.

HUGHES, Edward Thomas, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London. —(*A communication from Wilbur Fisk Parker, of the city of Meriden, county of New Haven and state of Connecticut, United States of America.*)—"Improvements in locks for fire arms."

This invention relates to an improvement in locks for fire-arms, especially for breech-loading or revolving arms, the object, being to cause the hammer to rebound after it has caused explosion; and the invention consists in the construction of the tumbler combined with the sear, so that after the hammer has been thrown down, an over-motion being given to the spring, the sear will throw the tumbler and the hammer attached thereto back to half-cock.

A.D. 1872, January 19.—No. 181.

HANSCOM, William Wallace, of San Francisco, California, United States of America, mechanical engineer.—"Improvements in applying power to the wheels of traction engines, portable engines, excavators, "and other self moving machines."

This invention consists in combining machinery so as to use water as a medium for transmitting the power from the engines to the wheels of traction and portable engines, excavators, and other self moving machines, in place of toothed gearing, pitch chains, and the other ordinary appliances for transmitting power. By this combination economy of weight is obtained and facility of exerting the maximum tractive power of the machine at very slow speeds, or the minimum with great speed and in a much simpler manner, and with much simpler and more efficient combination than heretofore.

The general features of the combination are:—Connecting the engines directly to the driving wheels, and making them water pressure engines instead of steam, and using a steam pump and accumulator reservoir for obtaining any required pressure.

A.D. 1872, January 19.—No. 182.

SMITH, Aaron, of Batman's Hill, Bilston, in the county of Stafford, farmer, but by trade an ironworker. —"Improvements in apparatus for puddling iron."

This invention relates to that class of puddling apparatus, in which molten cast iron is decarburetted by being agitated in a rotating cylinder. To this end two or more puddling cylinders are arranged in a line, end for end, a furnace for generating heat and combustible gases being at one end and a flue or chimney shaft to produce a suitable draught being at the other end, so that the heated gases from the furnace may be carried through all the puddling cylinders in succession, the cylinders being kept in rotation all the time.

A.D. 1872, January 19.—No. 183.

MITCHELL, Jonathon, of Dyson Street, Bradford, in the county of York, contractor.—"Improvements "in furnace bars and bearers."

This invention relates to improved fire bars and a system of bearers composed of bars and chairs, so arranged that the whole net work of bars is held together by the simple weight of its parts, & at the same time is free to expand and contract in every direction, and offers every facility for renewal, cleaning, and adjustment.

A.D. 1872, January 19.—No. 184.

ANDREW, William Henry, of Sheffield, in the county of York.—"Improvements in securing and "ornamenting the handles of table cutlery and other articles."

This invention consists in securing knife handles and ivory handles for teapots by the use of a metal guard piece more or less ornamented, which extends across the end of the handle next the bolster and down one or both sides of the handle in the form of a tongue or tongues; a hole being made in the cross piece for the passage of the tang, and a pin or pins being inserted transversely through the handle, through the tongue or tongues, and through the tang.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 13 to July 19, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, January 20.—No. 188.

BOOTH, Joseph, of 29, Gamble Street, Nottingham.—" Improvements in the manufacture of fabrics in " twist lace machines."

This Provisional Specification describes the production of fabrics ornamented with thick pillars, consisting of core threads enclosed by covering threads which are woven around them.

A.D. 1872, January 20.—No. 195.

HULSE, William, of Birmingham, in the county of Warwick, metallic bedstead manufacturer.— " Improvements in metallic bedsteads, cots, couches, and chairs, and in machinery or apparatus to be " employed in the manufacture of the said articles; parts of which improvements are also applicable to the " manufacture of metallic railing for other purposes."

According to this invention the sackings of metallic bedsteads and similar articles are made of a series of longitudinal metallic laths, having coiled springs at each end. The said coiled springs are situated between sliding caps, and are hooked to the underside of the horizontal webs of the angle bars. Pressure being put on the laths, the springs are compressed between their caps and by their elasticity tend to restore the laths to their normal figure. Transverse elliptical or bow shaped springs are combined with laths having spring ends of the kind described.

The vertical and horizontal tubes of which the head and foot rails of metallic bedsteads and other articles are composed are joined together as follows. A screw nut is secured in the top of each vertical tube by indenting the tube above and below the nut. A cap or ferrule having a concave top and internal shoulder is dropped on to the top of the vertical tube, and the horizontal tube being placed on the cap or ferrule a screw with an ornamental head is passed through a hole in the horizontal tube, and made to take into the screw nut in the top of the vertical tube. The two tubes are thus connected together. The fixing of the screw nut in the vertical tube and the formation of the concave top of the cap or ferrule and its internal shoulder are effected by dies and pressing or percussive tools. The holes in the horizontal tube through which the fixing screws pass are drilled by means of a machine provided with a spring support, in which the tube is placed and supported while being drilled, and pressed against the drill. A rod situated at right angles to the drill carries an adjustable horizontal peg fixed at a distance from the drill, equal to the distance between the holes to be drilled in the tube. After one hole has been drilled, the hole is brought onto the peg, by which the tube is held firmly and truly in its place while a second hole is drilled, and so on. The holes are thereby drilled very truly both with respect to their distance apart and their direction.

Railing for various purposes may be constructed of tubing joined in the manner described.

A.D. 1872, January 22.—No. 200.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Emile Muller and Auguste Eichelbrenner, both of Paris, France, civil engineers.*)—" Improvements in furnaces and apparatus connected therewith, more especially designed for " an improved method of heating gas retorts."

This invention relates to heating furnaces by oxide of carbon, tar, and small combustibles. I employ a regular and continuous feed not only of coke and coal but of divers other combustibles. The old grate is removed (or covered with refractory bricks or tiles); the ashpit is filled up. At the back of the retorts I place a small grate and a hopper. This hopper is filled from above with combustibles which descend as fast as the quantity upon the grate is consumed; hot air is introduced by passages. Small dampers are used to regulate the quantity of air admitted. I arrange between the ends of the retorts and the hopper a passage whereby I can introduce combustible liquids. I may employ a single hearth, but for a great number of furnaces the heating of the air destined for the combustion of the oxide of carbon is effected more conveniently in a special heat recuperator.

A.D. 1872, January 22.—No. 202.

HIGGINSON, Andrew, of Liverpool, in the county of Lancaster, marine draughtsman.—"Improvements "applicable to motive-power-engines, engine-governors, and pumps."

Consists of a cylinder, through which passes a transverse shaft, by which it is mounted on a stationary frame in such a manner that the same may be stationary or allowed to vibrate a given distance within its frame when used as a governor, or is secured to the frame when used as a pump or motive power engine. This external cylinder encloses a small cylinder eccentric to the transverse shaft, which is of, say one-third of the internal diameter of the external cylinder, which is again encompassed by a second eccentric intermediate cylinder of say, two-thirds of diameter of external cylinder, and through the peripheries of which passes a blade or blades which constitute the piston or pistons and are in direct contact with the inner surface of the outer cylinder, the outlet and inlet ports being arranged according to the purposes for which the machine is intended to be used.

A.D. 1872, January 31.—No. 309.

PARKER-RHODES, Charles Elmes, of Brixton, in the county of Surrey, gentleman, late of the British Consular Service.—"Improvements in the construction of military and other boots and shoes or coverings "for the feet and legs."

This invention relates to the construction of a boot, shoe, or foot, or foot and leg covering, which is capable of adjustment at any moment to the foot. Between the inner and outer soles is inserted an intermediate sole of leather cloth or other waterproof material. A wooden heel is secured thereto faced with a wearing surface of leather, which is secured by screws (by preference), which enables the wearer to replace the same when worn out. The upper (made in one or more pieces) is secured (by preference) by screws between the inner sole of leather cloth or other waterproof material and the outer sole.

The inventor adds a vamp shield reaching above the instep, or a toe cap secured between outer and clump soles. The uppers secured over the outside (as also the vamp shield or toe-cap) by means of eyes and buttons, through and partly around which a single lace is passed and fastened at the upper part.

A.D. 1872, July 13.—No. 2119.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Emil Friedrich August Schott, of Leesen, Germany, chemist.*)—"An "improved gypsum-cement."

I reduce natural anhydrite by any known mechanism to a coarse grained or fine powder, and mix it with 73.5°/o of limestone powder or chalk. The mixture thus obtained is heated in a puddling furnace, so that it becomes liquid, and then it is crutched by means of iron tools through a side opening and cooled. The furnace is then again filled. To melt the mixture I use the well known furnace of Siemens as employed to puddle pig-iron or any other furnace, by which a temperature of 2000° C can be obtained, the melting of the mixture being only obtained at a full white heat.

A.D. 1872, July 13.—No. 2121.

JONES, Robert, of Liverpool, in the county of Lancaster, gun manufacturer.—"Improvements in central- "fire breech-loading sporting guns."

Consists in a peculiar shaped locking bolt arranged and operated, and which by its action fastens down the barrels when the gun is closed, and an arrangement of strikers which are carried back on the gun being opened for reloading, so that they are held back both during the opening and closing of the gun, effectually preventing the accidental discharge of the cartridge.

The strikers slide freely within their recesses and are without springs.

The locking bolt is actuated by a lever having its pivot below the bolt, the outer arm of which lies against the front of the trigger guard, or in other convenient situation.

A.D. 1872, July 15.—No. 2127.

HYDE, Oliver, of Oakland, county of Alameda, State of California, in the United States of America.—
" Improvements in steam traction road wagons, commonly known as road steamers, which may also be used
" as a steam plow or farm wagon, including improvements in elastic tires or treads for traction wheels, im-
" provements in the steam boilers to be used on said traction engines, also improvements in mounting
" and operating independently at the rear of said wagon, a series of revolving screw shaped cultivators."

This invention relates to improvements in steam traction wagons, such as are employed for travelling upon common roads, ordinarily upon the ground without the intervention of rails or a prepared track.

The improvements consist:—In an elastic tire composed either of elastic cylinders or polygonal blocks in short or long sections, or of elastic balls; in the combination with the elastic cylinders, of a shoe provided with a wedge block; in providing the boiler with vertical tubes, around each of which is a shell with ribs at the lower part forming legs or supports; also in attaching to the rear of said traction wagon a series of revolving screw shaped cutters or blades for digging, cutting, or turning the soil, when it is desired to convert the steam wagon into a steam plough or cultivator, these cutters or revolving blades being attached to the wagon frame in such a manner that each cutter has a motion up and down independent of each of the other cutters of the series, thus permitting them to follow the inequalities of the ground, and cut a furrow of equal depths at all times; or a series of common ploughs are used, in which case a device is provided for allowing each an independent action in the same manner, and the lifting of them instantaneously out of the ground.

A.D. 1872, July 16.—No. 2135.

BROWER, Bloomfield, of the city of New York, in the state of New York, in the United States of America.—" An improvement in card-holders."

The nature of my invention consists in the construction of a case for holding address cards or similar articles, with moveable sides to adapt the same for any size of cards or other goods. The moveable side-frames are made with projections fitting into suitable and corresponding recesses in longitudinal slots or openings made in the back plate, whereby the side frames may be moved nearer together or further apart; or suitable pieces are made on the back of these side-frames passing through longitudinal openings or slots made in the back-plate and secured in any desired position apart from each other by means of nuts to correspond with the length of the card to be placed between. To support the cards a flange is either attached to or cast on the back-plate below the side frames, or a flanch is made at the bottom of these side frames, or only a single broad stud, working in corresponding recesses provided in the back-plate for the cards or similar articles to rest upon.

A.D. 1872, July 19.—No. 2164.

PAYNE, Robert, of Frome, in the county of Somerset, solicitor.—(*A communication from James Alexander Read, of Enfield, near Sydney, in the Colony of New South Wales, second clerk in the Supreme Court of the said Colony.*)—" Indicating the variations of heat in holds of vessels, rooms, or other places at a distance."

First. The effecting the rising or movement in an inverted syphon of liquid, such as coloured sulphuric acid or other suitable liquid, to various degrees or points, according to the expansion and consequent pressure of the air below or behind such liquid caused by the action of heat in any place, the temperature of which it is desired to ascertain, and thus indicating the temperature in such place.

Second. The use of a bulb vessel or chamber in the place, the temperature of which is to be indicated, which bulb vessel or chamber being a conductor of heat and consequently facilitating and effecting the action of the heat in such place upon the air within such bulb chamber or vessel creates a corresponding or proportionate expansion of the same to register temperature at distances and in places difficult of access.

Third. The use of a vulcanized india rubber or gutta percha tube or tubes, one within the other, covered and protected, if necessary, by other tubes or pipes, as hereinbefore particularly described, the inner one to connect the glass chamber or vessel above spoken of and the indicating syphon, the insulation of the two tubes by means of an air passage between preventing the action of the heat at any place or point except when such bulb, vessel, or chamber is placed.

Fourth. The application of the principle of the expansion of air by heat, and the consequent pressure outwards of the same, and the restricting or confining such pressure to a point at which the expansion of the air lifts or moves a liquid to various marked degrees by means of the use of the indicating syphon and of the bulb vessel or chamber above described, and the transmission of the same by means of a tube as herein described.

Fifth. The application of air cocks of the form and kind above mentioned attached to the syphon, releasing the liquid in the same from internal and external atmospheric pressure, and for the purpose of restoring the equilibraim of the liquid within the said indicator or syphon, in the same manner and form above specially mentioned and described.

Sixth. The application of a second tube attached to the second arm of the syphon as before described, and the use of the bulb or globe at the top of the same, and the use of the air-cock, by all which means the expanding and resisting properties of the air in all parts and sections of one tube are balanced by the expanding and resisting properties in a second tube, and the syphon is made to indicate the expansion of the air in the heat bulb alone.

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AND TO

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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 19, 1872, and to Appendixes from January 20 to July 19, 1872.

This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. Terms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where also single copies may be obtained at 4*d.* each, except the concluding number (containing the complete Indexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders to be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commissioners of Patents.

ERRATA IN CHRONOLOGICAL AND DESCRIPTIVE INDEX
For Quarter ending 30th September 1869.

Page 484, lines 47 and 48, *strike out the words* "Provisional Protection only."
Page 531, lines 15 and 16, *strike out the words* "Provisional Protection only."

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn.
Friday, July 26, 1872.

CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 20 to January 26, 1872.

A.D. 1872, January 20.—No. 185.

BRACEWELL, William, of Waterside, Colne, in the county of Lancaster, blacksmith, **RILEY, Edmund**, of the same place, publican, and **BRACEWELL, James**, of Marsden, near Colne aforesaid, blacksmith.—"Improvements in machinery for distributing manure."

Our invention consists in the application of one or more rollers or a scraper or other equivalent for removing the manure from a hopper shaped cart, and for distributing it on the field, also in the gearing for actuating the same and for stopping and starting the working parts.

A.D. 1872, January 20.—No. 186.

WRIGHT, Robert Samuel, of the Inner Temple, London, barrister at law.—"Improvements in setting "hydraulic rams."

This invention relates to a mode of placing or setting what are known as hydraulic rams for elevating water, whereby a slope however long and gradual may be economically and effectively converted into a sudden fall, whilst obviateing the expense of constructing a dam, reservior, or open cutting, as has heretofore been considered necessary in setting hydraulic rams. In carrying out my invention, supposing that from the mouth of a spring or stream a fall of, say ten feet, is obtainable in five hundred yards, I convert this gradual fall at once to a sudden fall or head of ten feet perpendicular by placing the ram at the bottom of a well or vessel sunk at the mouth of the spring, the water for working the ram and to be thereby elevated, as is well understood, being conveyed by a vertical pipe leading directly downwards to the said ram.

In order to carry off the waste water from the bottom of the said well or sunk vessel I propose to employ, in combination with the above mode of setting the ram, the double or inverted continuous action syphon known as the "Weurtemberg" syphon, one leg of which is to be placed in the well or vessel containing the sunk ram and the other carried either the entire five hundred yards of gradual descent or slope to the place of outfall or carried into a nearly level drain, which extends from the lowest point of discharge to, as nearly as practicable, the well or sunk vessel containing the ram.

A.D. 1872, January 20.—No. 187.

SMYTH, Samuel Richard, civil engineer, of Ethelburga House, 70, and 71, Bishopsgate Street, in the city of London.—"A new self acting machine or apparatus for working sewing or other similar machines "that are worked by foot treadles or by hand or by other power."

My invention consists of machinery or clock work formed of wheels either with cogs or with friction wheels which are put in motion by a barrel spring or springs wound up either in box or out of same, also by a lever spring or springs with one or more plates, or of a spiral spring or springs brought into power and motion by winding up either unto or into a barrel or barrels and on verge or cone or even pulley either grooved or plain, and connected with a chain of any formed links and metal, or of gut cord or leather, or of wire cord or rope of any metal. The whole former so as to transmit the power from spring barrel to wheels, thence to either the crank or paddle shaft or the direct to the speed motion of the machine itself.

A.D. 1872, January 20.—No. 188.

BOOTH, Joseph, of 29, Gamble Street, Nottingham.—"Improvements in the manufacture of fabrics in "twist lace machines."

This Provisional Specification describes the production of fabrics ornamented with thick pillars consisting of core threads enclosed by covering threads which are woven around them.

A.D. 1872, January 20.—No. 189.

WARNER, Arthur, of Lee, in the county of Kent.—"Improvements in the manufacture of iron and steel "and in apparatus employed therein."

This invention relates to the blowing or forcing of certain gases or ingredients through molten iron by the Bessemer or other similar process for the purpose of refining and making malleable iron or steel.

The said gases and ingredients are to be used alone or mixed with air, and the invention also relates to improved means or modes and arrangements of apparatus for manufacturing and employing these gases when used for this purpose and introducing them into the converter.

These improvements relates to the means of preparing hydro-chloric acid gas for the purpose of employing it in the manufacture of iron and steel, also for the preparation of hydrofluoric acid gas for this purpose.

Also for the preparation of hydrogen gas for the above purpose.

The invention also relates to the preparation of chlorine gas for the same purpose. Also in the preparation of ammonia.

The invention also relates to certain means and arrangements of apparatus employed in the preparation of the various gases employed in accordance with these improvements.

The air may be charged with tar or other hydrocarbon for purifying the iron.

Volatile salts of ammonia may be introduced into the converter by passing hot or cold air over them in retorts or pipes which may be heated externally if necessary.

When the air is passed through the apparatus it should be (by preference) previously made hot, say 300° Fahrenheit or other suitable heat to prevent the necessity of applying external heat, and the pipes from the generators of each different gas should be so arranged, that either all or any of them can be introduced into the converter separately or together.

The pipes or other parts of the apparatus should be lined with lead, plaster of paris or other cement not liable to be attacked by the corrosive action of the gases employed.

In some cases, purifying salts such as the chlorides of the alkalies iron and manganese, prussiate of potash, and carbonate or oxide of manganese are introduced separately or combined into the blast before it enters the converter.

A.D. 1872, January 20.—No. 190.

GASKELL, Peter, of Stafford Street, Birmingham, in the county of Warwick.—"Improvements in "apparatus for drawing off liquids."

This invention consists of supplying a lever and stop cock in the rising main of a pump or other like apparatus for the admission of air, also for attaching a tube to cocks for casks or vessels in connection with a plug vent for the like purpose.

A.D. 1872, January 20.—No. 191.

HUGHES, Edward Thomas, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London. —(*A communication from Emile de Labarre, of Ensival, Belgium.*)—"Improvements in the preparation of "wool, either pure or mixed with other fibrous materials intended to be spun into threads or yarns to be "used for weaving."

The object of this invention is to effect economy in labour and material employed in the preparation of pure or mixed wools, and it offers great advantages over the methods at present in use by the entire suppression of the system of greasing the fibrous materials.

To carry this invention into operation, the wool, pure or mixed, is submitted to the first carding machine without subjecting it to any greasing whatever, this being entirely opposed to the method at present in use; but if the threads for weaving are required to be perfectly clean, and the wools or other fibres are likely to prevent that object, the wool and fibres are subjected to a complete washing before they are mixed togther, and then after the materials are mixed and carded they are prepared and spun in the ordinary manner.

Thus the spun thread is entirely without grease, and is thereby capable of being at once wound on bobbins or formed into hanks or skeins and also be employed for weaving without requiring washing.

It is evident that by this improved process there is great economy arising from the entire suppression of the greasing matters, the labour of the operatives in first applying the grease, and then removing it from the hanks, skeins, or bobbins, and also in the prevention of the great number of broken ends arising from the frequent manipulation of the fibres and threads.

A.D. 1872, January 20.—No. 192.

MACDIARMID, Angus Stewart, of Liverpool, in the county of Lancaster, wool merchant.—"Im-" provements in machines for cleaning wool skins."

The object of my invention is to provide mechanism by which wool skins, more particularly South American, Australian, and Cape sheep and lamb skins, may be effectually freed from burrs, seeds, and foreign matter.

For that purpose I employ, under one modification of my invention, a rotating drum fitted on its periphery, with knives or beaters whose attacking surfaces are of a serrated, irregular, or curvilinear outline. or with knives or beaters of the form described alternating in any order with straight edged knives or beaters.

Under another modification I employ two rotating drums, one fitted wholly or partially with the said serrated, irregular, or curvilinear edged knives or beaters, and the other with straight edged knives or beaters.

The skins are, by preference, when being acted upon by the said machines fed and guided by hand either or a flat surface or over a drum.

A.D. 1872, January 20.—No. 193.

LLOYD, Samuel, of Sparkbrook, in the county of Warwick, iron tube manufacturer. —"New or " improved apparatus for lighting fires and promoting combustion in fires."

This invention consists in lighting fires or promoting combustion in fires by means of gas supplied to one or more gas burners or jets arranged underneath the fire grate or stove. The gas burners, which may be rose or Bunsen's or other burners are carried by adjustible caps or collars screwed internally and working upon screwed vertical branches on the end of a gas supply pipe in connection with the gas service of the house. By screwing the caps or collars on the screwed branches the height of the gas burners or jets from the bottom of the grate or stove may be adjusted. On opening a tap or valve connected with the gas supply pipe and igniting the flames they ascend through the openings between the bars of the grate, and speedily light the fire. When the fuel burns sluggishly or requires a high temperature for its combustion, the burning of the gas is allowed to continue so as to promote the combustion of the fuel.

A.D. 1872, January 20.—No. 194.

SCRUTON, Thomas Kossuth, of Birmingham, in the county of Warwick, tailor and outfitter.— " Improvements in the manufacture of neck ties or cravats."

According to this invention the material of which the sailor's knot of the neck tie or cravat is made is joined at the edge of the knot, or the knot is made of two pieces of material joined together at the opposite edges of the knot. Both faces of the knot have consequently the same appearance. The two depending ends of the tie or cravat are so fixed to the knot that their back or inner faces are turned towards each other. The free end of the neck band is fastened by a spring clip or pin in the interior of the knot as usual.

Neck ties or cravats so made may be worn with either side outwards, and can be put on with equal facility by right and left handed persons.

A.D. 1872, January 20.—No. 195.

HULSE, William, of Birmingham, in the county of Warwick, metallic bedstead manufacturer.— " Improvements in metallic bedsteads, cots, couches, and chairs, and in machinery or apparatus to be " employed in the manufacture of the said articles; parts of which improvements are also applicable to the " manufacture of metallic railing for other purposes."

According to this invention the sackings of metallic bedsteads and similar articles are made of a series of longitudinal metallic laths, having coiled springs at each end. The said coiled springs are situated between sliding caps, and are hooked to the underside of the horizontal webs of the angle bars. Pressure being put on the laths, the springs are compressed between their caps and by their elasticity tend to restore the laths to their normal figure. Transverse elliptical or bow shaped springs are combined with laths having spring ends of the kind described.

The vertical and horizontal tubes of which the head and foot rails of metallic bedsteads and other articles are composed are joined together as follows. A screw nut is secured in the top of each vertical tube by indenting the tube above and below the nut. A cap or ferrule having a concave top and internal shoulder is dropped on to the top of the vertical tube, and the horizontal tube being placed on the cap or ferrule, a screw with an ornamental head is passed through a hole in the horizontal tube, and made to take into the screw nut in the top of the vertical tube. The two tubes are thus connected together. The fixing of the screw nut in the vertical tube and the formation of the concave top of the cap or ferrule and its internal shoulder are effected by dies and pressing or percussive tools. The holes in the horizontal tube through which the fixing screws pass are drilled by means of a machine provided with a spring support, in which the tube is placed and supported while being drilled, and pressed against the drill. A rod situated at right angles to the drill carries an adjustable horizontal peg fixed at a distance from the drill, equal to the distance between the holes to be drilled in the tube. After one hole has been drilled, the hole is brought onto the peg, by which the tube is held firmly and truly in its place while a second hole is drilled, and so on. The holes are thereby drilled very truly, both with respect to their distance apart and their direction.

Railing for various purposes may be constructed of tubing joined in the manner described.

A.D. 1872, January 22.—No. 196.

WALKER, GEORGE, of Newtownards, in the county of Down, in Ireland, flax spinner and manufacturer. —" Improvements in the manufacture of coarse textile fabrics."

This invention consists in manufacturing coarse cloths by using hay or straw or a mixture of hay and straw for the weft with any strong material such as flax, flax tow, or hemp, or jute yarn for the warp threads.

The hay and straw are specially selected for the maximum of tough fibre they contain, and are twisted into ropes and interwoven with the warp in an ordinary loom.

A.D. 1872, January 22.—No. 197.

BILLINGTON, THOMAS, of Bamber Bridge, in the county of Lancaster, spinning master.—" Improvements in mules for spinning."

In the ordinary working of the spinning mule the minder, while forming the bottom of the cop, has to turn the quadrant screw a little, nearly every draw, thereby taking his attention from pieceing-up, which is a consequent loss; by the application of this simple invention no attention is required from the minder from the beginning to the finish of the building of the cop, and such can be applied in a few hours at a comparative small cost.

A.D. 1872, January 22.—No. 198.

BAÑOLAS-ARNAU, RAMON, of Madrid, in the Kingdom of Spain, at present residing at No. 19, Torrington Square, in the county of Middlesex.—" Improvements in apparatus for registering the quantities of " liquids withdrawn from casks or other receptacles."

This invention consists in fitting the pipe leading from the cask to the tap or engine with a low pressure liquid meter, and in connecting the tap or engine to a " counter " mechanism, whereby each opening of the tap is registered by the counter, while the quantity of liquid withdrawn is registered by the meter. The mouth of the tap is provided with a helical blade so as to cause the liquid to issue in an oblique direction into the measure.

A.D. 1872, January 22.—No. 199.

JOY, DAVID, of Middlesbrough, in the North Riding of the county of York, engineer.—" Improvements " in the means and apparatus for the removal of slag from blast furnaces."

My improvements consist in receiving the slag as it runs from the furnace into recesses formed in the rim of a wheel or cylinder (either outside or inside or on the edge thereof), in which it is carried through a part of the revolution of such wheel or cylinder, and then discharged therefrom, the axis of revolution of such wheel or cylinder being either horizontal or inclined in such wise that each part of the circumference shall alternately be raised and lowered during the revolution. And I make the recesses of such form, and place them in such position with regard to the centre of revolution, that the slag may be retained in them during a considerable part of the revolution of the wheel or cylinder. And, if necessary, I form ridges in points in the bottoms of the recesses to mould the slag in such form as to break easily in pieces. The recesses also, at the point where they receive the melted slag, have such inclination as to cause the material easily to flow over their surfaces. And I treat the slag during its passage through the machine with a blast of cold air alone or of combined air and water forming a cold vapour, or I simply cool the recesses after they have discharged their contents, leaving their cooled surfaces to solidify the slag; and I actuate such machine by any of the known mechanical arrangements, but I prefer to use hydraulic power, the waste water from which I use to complete the cooling of the slag.

A.D. 1872, January 22.—No. 200.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Emile Muller and Auguste Eichelbrenner, both of Paris, France, civil engineers.*)—"Improvements in furnaces and apparatus connected therewith, more especially designed for "an improved method of heating gas retorts."

This invention relates to heating furnaces by oxide of carbon, tar, and small combustibles. I employ a regular and continuous feed not only of coke and coal but of divers other combustibles. The old grate is removed (or covered with refractory bricks or tiles); the ashpit is filled up. At the back of the retorts I place a small grate and a hopper. This hopper is filled from above with combustibles which descend as fast as the quantity upon the grate is consumed; hot air is introduced by passages. Small dampers are used to regulate the quantity of air admitted. I arrange between the ends of the retorts and the hopper a passage whereby I can introduce combustible liquids. I may employ a single hearth, but for a great number of furnaces the heating of the air destined for the combustion of the oxide of carbon is effected more conveniently in a special heat recuperator.

A.D. 1872, January 22.—No. 201.

FOX, Howard Busby, of Oxton, in the county of Chester.—"An improved filtering jug."

The feature of novelty which constitutes this invention is the adaptation of a filtering medium to jugs, manufactured under Letters Patent, No. 1435, dated 30th May, 1871. To carry out the adaptation, the jug is divided into two compartments by a horizontal division, moulded or attached to and forming part of the jug. This division has an orifice, into which is fitted a carbon block with suitable air pipe, or in lieu thereof a case or box having a perforated bottom and filled with layers of flannel or felt, charcoal, and sponge. The liquid to be filtered is poured into the top compartment, from whence it percolates or filters through the carbon or charcoal to the lower compartment, from which it is poured off through a nozzle or spout up the side, sufficient air being admitted through the pipe or tube to the compartment below.

A.D. 1872, January 22.—No. 202.

HIGGINSON, Andrew, of Liverpool, in the county of Lancaster, marine draughtsman.—"Improvements "applicable to motive-power-engines, engine-governors, and pumps."

Consists of a cylinder, through which passes a transverse shaft, by which it is mounted on a stationary frame in such a manner that the same may be stationary or allowed to vibrate a given distance within its frame when used as a governor, or is secured to the frame when used as a pump or motive power engine. This external cylinder encloses a small cylinder eccentric to the transverse shaft, which is of, say one-third of the internal diameter of the external cylinder, which is again encompassed by a second eccentric intermediate cylinder of say two-thirds of diameter of external cylinder, and through the periphories of which passes a blade or blades which constitute the piston or pistons and are in direct contact with the inner surface of the outer cylinder, the outlet and inlet ports being arranged according to the purposes for which the machine is intended to be used.

A.D. 1872, January 22.—No. 203.

STONE, Robert, of Liverpool, in the county of Lancaster.—"An improved system of casting or moulding "applicable to ceilings, internal and external walls, roads, navigable vessels, and other large surface "structures."

This system consists in constructing ceilings with the cornices and all ornamentation by means of subdivided moulds, so placed that the material to form the same is run into the moulds in the position it is to remain, thus forming a ceiling in one sheet, and may be done at one operation in place of constructing the same in driblets from below as now practised. The same arrangement is applicable to the facing of walls partitions, forming of chimney pieces, architrives, and so forth, or other surfaces with plaster, cement, or fluid metal.

This system is also applicable to the construction of foot ways and roads; generally in the case of roads for draught animals they are formed with grooves, which are afterwards filled in with elastic material to give foothold to the animals.

In the case of plaster, sometimes an iron or other wire netting or open wire work is embedded therein for the purpose of giving additional strength. In casting large surface structures a series of undercut metal frames, which are previously tinned, are introduced between the internal surface of the mould and the external surface of the core, so that, when the fusible or liquid matter is run in, the whole forms one solid shell.

An arrangement for combining sections of large cast surfaces uniting the several parts into one.

A.D. 1872, January 22.—No. 204.

SMITH, Thomas James, of the firm of Robertson, Brooman, and Company, of 166, Fleet Street, in the city of London, patent agents.—(*A communication from Charles Poron and Amand Poron, both of Troyes, France, manufacturers.*)—"Improvements in knitting frames or machines, with appliances for diminishing or "fashioning articles made thereon."

This relates to appliances for producing plain or ribbed fabrics at the will of the operator; also to appliances for narrowing or fashioning the work automatically, the whole of the appliances being combined in the same frame or machine. Some special features in the frame are claimed.

A.D. 1872, January 23.—No. 205.

LEIGH, Evan, of the city of Manchester, in the county of Lancaster, mechanical engineer.—"Improvements in the construction and propelling of ships for railway ferries and other purposes."

The railway ferry or other boats are made by preference of Bessemer steel or other castings, or of an alloy of metals that will be tough and resist the action of sea water, the principle being to have square or oblong plates flanged all round to a sufficient depth to rivet together, the hull being so set out as to form segments of a circle.

These plates are bored, punched, or have the holes cast in to a gauge or template, so as to be for certain parts of the ship all alike, and the flanges are slightly turned in to a proper angle, so that when rivetted together they will form a bend to the curve of the ship's sides, and for the bottom a slighter bend or no bend at all as the case may be.

The flanges of the plates form the ribs of the vessel and are turned up in proportion to the size of the plates or strength of ribs required, and, when a vessel is intended to have a double bottom or double sides, the flanges of the plates for the inner shell of the hull are placed outside and tied together with midfeathers.

The outer hull of the vessel is attached to the inner hull, commencing at two or more feet from the bottom, and run all round in a **C** shaped section; and on the top of this are placed vertical sides or bulwarks which also go round the ship, but what is preferred is to place one vessel within the other in such a way that the inner vessel, which has a flat or nearly flat bottom, projects two or three feet lower in the water than the outer rudder.

This inner vessel has a double girder bottom and rudder placed at each end, which rudders together with their shafts are each made by preference of one piece of cast iron hollowed out so as to buoy up their own weight; and the two rudders are connected together by steel bands and chains, so that, when one is moved, the other moves also in the opposite direction. Each rudder is provided with a valve to diminish its area, when required, or with a means of shortening its length or width, the object being to balance the two more perfectly by lessening the power of the forerudder. These rudders may be acted upon separately or connected together by any convenient machinery.

The paddle wheels of ferry boats and other steam ships are each formed of a cast iron cylinder about half of the diameter of the intended paddle wheel, the cylinder being cast in two parts bolted together in the middle and keyed to bosses on the paddle shaft, and has an outer flange at each end, to which wrought iron plates are rivetted that extend to another outer cylinder of the full diameter of the paddle without floats and to which the latter are fixed The cavity formed betwixt the two cylinders is water tight, and is suitably strengthened by stays.

These paddles which are detached from each other are driven by a pair of engines to each, one being high and the other low pressure; and the expansion valve of each high pressure cylinder is acted upon by a steering wheel or other arrangement on deck.

A.D. 1872, January 23.—No. 206.

HUGHES, Hesketh, of Homerton, in the county of Middlesex, engineer.—" An improved fastener for " scarves and neckties."

Spring flap fasteners are made from two pieces or plates of metal.

A.D. 1872, January 23.—No. 207.

HOTCHKISS, Benjamin Burkley, of New York, United States of America, civil engineer.—" Improvements in wood pavements and in machinery for laying the same."

This invention relates to creating a perfect foundation and construction of wood pavements by employing a double flooring, so constructed as to break joints, and by placing a strip to form the spaces between the blocks the width of about one-half the height of the blocks. Between these blocks and above the strips small stones are driven mixed with cement, a machine hammer being employed for forcing said stones between the blocks.

A.D. 1872, January 23.—No. 208.

DI TERGOLINA, Vincenzo, Count, of Bernard Street, Russell Square, in the county of Middlesex.— " Improvements in the construction of bits for horses and animals."

Constructing bits with two swivels or joints in or on the mouth-bar at or near the ends thereof, and with a side plate to go outside the mouth of the animal on each of the two outer of the three parts or members of the mouth bar constituted by such arrangement of the swivels or joints. A compromise is also intended, consisting in the application of side plates to go outside the mouth of the animal on and at or near to the end of each of the two members or parts constituted by this arrangement. Also constructing the side levers of curb bits with the lower ends or portions made heavier or loaded (or so that they may be loaded) to make them heavier than the upper ends or portions.

A.D. 1872, January 23.—No. 209.

ASQUITH, James Dixon, of Morley, near Leeds, in the county of York.—" Improvements in machinery " for fulling or milling and washing woollen and other woven or felted fabrics."

Two pairs of rollers placed horizontally and side by side, the two bottom rollers being fitted onto the same shaft, are by preference employed. For conducting the material between them I mount a pair of guide rollers in front of each pair instead of the " throat " of ordinary construction.

A.D. 1872, January 23.—No. 210.

BRADBURN, William, of the firm of " Bradburn and Co.", of Wednesfield, near Wolverhampton, in the county of Stafford, manufacturing chemists.—" A new application of the gases and vapors or fumes resulting " from the burning of pyrites cinders, and of the acid liquid produced by the absorption thereof."

The inventor employs the gases and vapors or fumes resulting from the burning of pyrites cinders, and the acid liquid produced by the absorption of the said gases and vapors or fumes for the treatment or dissolving of phosphatic materials either for their application in the manufacture of superphosphate or other phosphatic fertilizers, or for the extraction of the phosphoric acid or phosphatic compounds for other purposes; and this object is accomplished by passing the said gases, vapors, or fumes through suitable chambers or flues containing phosphatic material, and by passing the said acid liquid down suitable towers containing such material, the undissolved residue being afterwards stirred in the said acid by means of agitators.

A.D. 1872, January 23.—No. 211.

WOOD, Alexander, of Edinburgh, in the county of Mid Lothian, North Britain.—" Improvements in " cleaning tramways, and in apparatus employed therefor."

The feature of novelty which constitutes this invention is, the arrangement of apparatus wherein the chief feature is the employment of depending " pickers " for cleaning out the grooves of the tramway rails of any soil or other obstruction, which is thrown by means of guides to the one side.

A.D. 1872, January 23.—No. 212.

WOOD, Robert James, of Edinburgh, in the county of Mid Lothian.—" Improvements in sweeping " streets or roads and in the machinery or apparatus employed therefor."

The feature of novelty which constitutes this invention is, the arrangement of mechanism whereby the sweeping action is performed, the sweepings deposited in a trough, and from thence elevated by an archimedian screw high enough to fall into any suitable receptacle.

A.D. 1872, January 23.—No. 213.

WOOD, Alexander, of Edinburgh, in the county of Mid Lothian, North Britain.—" Improvements in " tramway cars."

The feature of novelty which constitutes this invention is the forming of the cars oval or elliptical and the placing of additional seats in the centre, whereby the weight and drag of such vehicles are both lessened.

A.D. 1872, January 23.—No. 214.

SALMON, Frederick William, of Bishopton, Stratford-on-Avon, in the county of Warwick.— " Improvements in incubators."

Each incubator consists of a square tin box divided into three compartments, in the upper one of which on a layer of silver sand the eggs are placed.

This compartment is provided with a trough kept filled with distilled water, which when the apparatus is in proper working order gives off a very fine moisture, which acts upon the eggs in a similar manner to the natural perspiration of the mother or hen bird.

The second compartment is for water, which is heated by an " argand " gas burner or by a lamp placed in the lowest compartment.

A.D. 1872, January 23.—No. 215.

WHITTINGHAM, John, of the Cross, Willaston, Nantwich, in the county of Chester, surveyor.— " Improvements in road rolling engines, whereby they are made suitable also for other purposes."

This invention has for its object improvements in road rolling engines, whereby they are made suitable also for other purposes, and relates to the adaptation to and arrangement in combination with such engines of machinery or apparatus for breaking or crushing stones or other hard substances, in such manner as to enable the motive power of the combined machine to be employed either in propelling the engine for rolling roads or such like surfaces or in driving the machinery or apparatus for breaking or crushing stones or other hard substances.

A.D. 1872, January 23.—No. 216.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Julius Reimann, of Dresden, in the Kingdom of Saxony.*)— " A self-acting device for regulating the tension on the warps of ribbon and other looms."

The object of this invention is to regulate the tension on the warp beams of ribbon and other looms, and thereby to provide for the use of yarns of a far higher number than is at present employed in power looms.

A.D. 1872, January 23.—No. 217.

THOMAS, Arnold, of Cinderford, in the county of Gloucester, engineer. — " An improved drying " apparatus."

The apparatus consists of a vertical shaft revolving in a cylinder through which a current of air is passed. Circular conical shelves are affixed to the said shaft, and so arranged that the substance under treatment may pass downwards from one to another, the descent being assisted in some cases by suitably arranged scrapers.

A.D. 1872, January 23.—No. 218.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Thomas Silver, of the city and state of New York, United States of America, gentleman.*)—" Improvements in hoists or elevators."

I employ an obliquely set wheel or disc secured firmly to a shaft and having upon its outer face a screw thread radiating and increasing its radient in a tangential or rectangular direction from its axis; this disc is carried by the platform and is operated by a rope. The periphery of the disc is grooved to receive an endless rope for giving it motion. A vertical shaft, feathered or made square throughout its whole length, passes from the bottom of the elevator well through the platform or cage, and also through a screw carried with the cage and geared into the screw disc or wheel upon the shaft. This screw gears into other pinions which carry with them friction discs that are operated by a bar or handle. Antifriction guide rollers are used for guiding the platform.

A.D. 1872, January 23.—No. 219.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from James Brierly, of Worcester, and James Brierley, of Millbury, both in Massachusetts, United States of America.*)—"Improvements in mechanism for changing shuttle-boxes in "looms for weaving."

I employ an electing mechanism composed of a pattern-chain and levers, with a cam to raise the boxes and allow them to fall, whilst the exact time of their falling is determined by a cam and lever or other mechanism that releases them to fall when the lathe is at a certain point. I combine the raising and dropping mechanisms.

A.D. 1872, January 23.—No. 220.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Ellis Doty and George Washington Miltimore, both of Janesville, Rock county, state of Wisconsin, Rueben Mickel, of Chicago, Cork county, state of Illinois, and Ira Mickel, of New Lisbon, Otsego county, state of New York, all in the United States of America.*)—"Improvements in railway carriage axles "and wheels."

This invention has for its object to facilitate the movement of a railway carriage in rounding a curve.

For this purpose a hollow revolving axle is employed, upon which are loosely mounted the wheels supporting the carriage; said axle being supported upon a fixed axle and so arranged as to revolve thereon simultaneously with an independent revolving movement of the wheels.

The invention further relates to the construction of the said hollow axle and wheels whereby the same can be properly lubricated.

A.D. 1872, January 23.—No. 221.

DE TIVOLI, Vital, of Brixton, in the county of Surrey.—(*A communication from Luigi Giacomini, junior, of Treviso, in the Kingdom of Italy.*)—"Improvements in the manufacture of brushes, brush rollers or "cylinders, and brooms, and in machinery for the same."

According to this invention the bristles or fibres are compressed into tufts in a species of clamp from which they are forced into holes made in the brush stock for their reception, wherein they are held by their own elasticity.

A.D. 1872, January 24.—No. 222.

HINDE, Thomas Callender, of Founhope, near Hereford, colliery proprietor.—"Improvements in the "manufacture of iron and steel."

This invention consists in decarbonizing cast or refined iron for converting it into malleable iron or steel substantially in the following manner:—

The cast or refined iron is first reduced to a granular state or to small fragments, and the crushed iron alone or mixed with oxides of iron or other oxidizing bodies is then roasted, calcined, or decarbonized in an oxidizing atmosphere in a reverberatory or close furnace, the crushed iron being heated in the furnace to a point short of incipient fusion in order that no agglutination of the iron particles may take place. The decarbonized iron particles are next transferred from the decarbonizing chamber into a lower chamber, where they are heated to a much higher degree, and malleable iron or steel manufactured therefrom, according to the degree to which the decarbonization has been carried in the decarbonizing chamber.

A.D. 1872, January 24.—No. 223.

FORD, Alfred, of No. 21, Elgin Crescent, Notting Hill, in the coy. of Middlesex, gentleman.—"Improvements in the mode of treating linseed and other seed, and vegetable oils, so as the better to fit them "for employment in the arts and manufactures."

The novelty of this invention consists in producing in a simple and inexpensive manner fast drying oils without the necessity of boiling them and without the necessary agency of heat or long exposure to the atmospheric air or other oxidizing influences, as at present resorted to, and in preserving their colour and other properties unimpaired.

A.D. 1872, January 24.—No. 224.

LLOYD, Nathaniel, of the city of Manchester, in the county of Lancaster.—"Improvements in fixing "coloring matters on prepared fabrics or yarns."

This invention consists in fixing colors after dyeing, padding, or printing on prepared cloth or yarns, with madder, garancine, or the coloring matters extracted therefrom, or the artificial alizarine of commerce.

The inventor prepares the goods with oil or a combination of oil and alkali, and afterwards the inventor uses any mordaunt suitable for producing the color required.

When the goods are dyed, padded, or printed, the inventor subjects them to the action of steam, when they are ready for the soaping operations.

A.D. 1872, January 24.—No. 225.

FLOYD, Thomas, of No. 3, Adam Street, Adelphi, in the county of Middlesex.—"Improvements in "coverings for the head, whereby a refrigerating or cooling effect is produced."

This invention consists in constructing a waterproof cap, fitting closely over the head, provided with a hollow rim filled with water.

A covering of porous material is placed over the waterproof cap, and portions thereof pass through openings in the hollow rim, so that the water in the latter rises and spreads by capillary attraction over the porous covering, and in being evaporated therefrom produces a refrigerating effect. The porous material may be enclosed by a perforated covered.

A.D. 1872, January 24.—No. 226.

BERTIEAUX, Henri, of Antwerp, in the Kingdom of Belgium.—"Improvements in compound high and "low pressure steam engines."

The high and low pressure cylinders are constructed of one piece with a common axis, the pistons being connected together by a rod. The cylinders are either provided with separate slides connected by a rod so as to move together, or the admission of steam to both cylinders is regulated by one single slide, the steam and eduction ports being in either case so arranged that the steam passes from the high pressure into the low pressure cylinder.

The space between the two pistons is made to communicate with the atmosphere by means of apertures in the low pressure cylinder.

A.D. 1872, January 24.—No. 227.

RUSSELL, John Scott, of Sydenham, in the county of Kent.—"Improvements in ordnance and in "projectiles and cartridges for the same."

According to this Provisional Specification in the construction of ordnance, bronze lining tubes are used, and they are rifled in such a manner that the circumferential extension on firing may take place uniformly over the greater part of the circumference. The projectile fits the rifling, having grooves cut in it corresponding to ridges in the gun.

The powder in the cartridge is arranged in concentric cylinders and fired from the centre.

A.D. 1872, January 24.—No. 228.

DUFRENE, Hector Auguste, of No. 10, Rue de la Fidélité, Paris, in the Republic of France, civil engineer.—(*A communication from Monsieur Charles Tellier, a person resident at No. 99, Route de Versailles, Paris, in the Republic of France.*)—"An improvement in the process of refrigerating."

This invention consists in passing a current of air or gas over ethylic ether or other analogous liquid by means of mechanical pressure, and afterwards collecting the vaporized ether.

A.D. 1872, January 24.—No. 229.

HOLLINGWORTH, Margaret Harris, of Girlington, near Bradford, in the county of York—" "Improvements in boots and shoes and other coverings or protectors for the feet."

This invention relates to the employment of an electric conductor fixed in the inner soles of boots, shoes or slippers, or in clogs, for the purpose of driving away diseases, preventing epidemics, fever, small pox, and other contagious diseases, and dispelling noxious vapours.

A.D. 1872, January 24.—No. 230.

HANNAY Thomas, of Glasgow, in the county of Lanark, North Britain, ironmaster.—" Improvements in reversing mills for rolling iron."

The feature of novelty which constitutes this invention is the arrangement and employment of a spring clutch to act in combination with spring buffers on the driving wheels of reversing mills for rolling iron, whereby the usual jerking motion of such wheels on being reversed is greatly reduced.

A.D. 1872, January 24.—No. 231.

CRAPPER John Sugden, of Broad Street, Hanley, in the county of Stafford, manufacturing dentist. —" Improvements in apparatus for economizing and administering nitrous oxide or other gases for dental or surgical purposes."

This Invention consists principally of a tube fitted as a three wayed stop cock made of metal or other suitable material giving three distinct motions, different to any other now in use, also the arrangement by which the bottle containing the gas is secured to the container by an union joint. There is also a metal tray with sponge or other suitable material for holding lime for purifying the said gas when set free from the bottle during inhalation and exhalation; and an indian rubber bag, which becomes inflated by the gas from the bottle: the whole apparatus can be arranged in the most portable form.

A.D. 1872, January 24.—No. 232.

JONES, Harry, of the town and county of the town of Nottingham, auctioneer.—" A new or improved moustache protector and trainer."

The novelty consists in a small portable apparatus made of a leather shield or of other suitable material on a steel spring, so as to act as a trainer or protector for the moustache, the same result being however obtained by any flexible material suitable for the purpose.

A.D. 1872, January 24.—No. 233.

GATTY, Frederick Albert, of Accrington, in the county of Lancaster, manufacturing chemist.— " Improvements in ventilating sewers, drains, cesspools, and soil pipes."

My invention consists in connecting a pipe or shaft to the sewer, drain, cesspool, or soil pipe, and this pipe or shaft contains coke or other substance saturated with a disinfectant, or the pipe or shaft may contain shelves or cells filled with disinfecting substances.

A.D. 1872, January 24.—No. 234.

MOLLADY, John, of Denton, near the city of Manchester.—" Improvements in the manufacture of felt hats."

In the manufacture of woollen felt hats it has heretofore been customary to receive the web of woollen fibres from a carding engine on to revolving cones until a sufficient thickness has accumulated, this cone is then taken to the hardening machine, and from that to the milling machine to complete the body of the hat. Another mode of making the bodies of felt hats is by collecting short fibres of fur or fur and wool by exhaustion on a perforated cone. Now my invention consists in combining the two processes to produce improved felted hat bodies.

A.D. 1872, January 24.—No. 235.

BUDENBERG, Arnold, of the firm of Schäffer and Budenburg, of the city of Manchester.—(*A communication from Hermann Priew, of Magdeburg, in the Kingdom of Prussia.*—" Improvements in sugar refining, and in the centrifugal machines employed therein.

The features of novelty in this invention consist in the use and application of a peculiar construction of cover for the centrifugal machines used in sugar refining, enabling steam and air to be admitted instead of water, whereby the process of sugar refining is rendered more perfect, and a greater quantity of first quality sugar and secondry products are obtained, both of which are of a lighter colour, purer taste and odour, and attain to a higher degree of polarization.

A.D. 1872, January 24.—No. 236.

HUTTON, WALTER STUART, of Leeds, in the county of York, engineer.—" Improvements in the arrange-" ment and construction of forge hammers, stamps or other similar machines worked by steam or other " motive power for crushing ores and other purposes, and in utilizing the power resulting from the action " of such machines."

A cushion of india rubber or other suitable elastic substance is placed under the anvil block plate or bed of such machines, the movement produced by the compression or deflection of such elastic substance being employed for actuating the valve gear or other apparatus connected with such machines, or for giving motion to other mechanism independent thereof if required.

According to another part of these improvements several stamp heads worked by steam or other motive power upon the steam hammer principle are arranged in one grate box the form of which may be varied. The series of stamps or hammers may be so arranged as to strike their blow either simultaneously or alternately in succession to suit the purpose to which they are applied.

A.D. 1872, January 24.—No. 237.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 6, Piccadilly, in the county of Middlesex, and 18, Rue de la Chaussée d'Antin, Paris, France, patent agent.—(*A communication from Charles Alexandre Furon, a person resident at Belleville, France, machinist.*)—" A new and improved bellows " for forges, furnaces, or any other works."

This invention consists to give to the air feeding mouth a diameter twice as large as that of the outlet mouth, and to place the said outlet mouth on one of the sides of the casing of the bellows, and to keep in place the helix by means of moveable rings or hoops regulated by adjusting screws.

A.D. 1872, January 24.—No. 238.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 6, Piccadilly, in the county of Middlesex, and 18, Rue de la Chaussée d'Antin, Paris, France, patent agent.—(*A communication from Arthur Le Clercq, a person resident at New York, states of New York, United States of America.*)—" Certain " improvements in copying presses."

This invention relates to a copying press, composed of two pairs of elastic rollers, which are geared together and supplied with moisture from a suitable tank, and which are enclosed in a case containing a feed and discharge opening for the copying paper and the manuscript, in such a manner that by spreading a sheet of copying paper on a manuscript, and passing the two into the case, and through between the two pairs of rollers, a perfect copy is produced in a hort time and regardless of the size of the sheet containing the manuscript.

A.D. 1872, January 24.—No. 239.

PARRY, JOHN, of Manchester, in the county of Lancaster.—" Improvements in furniture castors."

This invention is intended to be applied principally to what are known as socket castors, such as are used for sofas, tables, and chairs, and is designed for the purpose of lessening the strain upon the pin or peg upon which the castor turns, and also upon the " horn " so as to cause the castor to turn more freely than heretofore and also to lessen its liability to breakage.

The invention consists in casting or forming on the upper part of the " horn " a vertical or slightly inclined prop, the upper end of which carries a friction roller or wheel which runs against the lower side of a circular projection or flange at or near the top of the socket.

A.D. 1872, January 24.—No. 240.

TAYLOR, WILLIAM, of Woolwich, in the county of Kent, naval architect.—" An improved method " or means of indexing or registering the condition or state of iron or metal ships, vessels, or other floating " bodies, as well as of marine and land boilers, reservoirs, tanks, masts, and other articles of metal."

The object of this invention is to lay open to view on an index or plan the whole of the interior and exterior surfaces of the hulls of iron or metal ships, vessels, or other floating bodies, also the shells of marine and land boilers, reservoirs, tanks, metallic masts of vessels, and other articles of metal, and have registered on such index or plan all defects and the gradual or rapid deterioration of all and every single plate of which the ship or other vessel is composed from the date when each was new until the same becomes entirely worn out. By this method will be shewn which plates have deteriorated gradually and which rapidly.

The invention consists mainly in an index or register, which to indicate the thickness of the plates of a vessel will have on it as many circles as the plates are thick. The deterioration of the inside of the vessel will be shown by filling in the circles from the top left hand corner, and the deterioration of the outside by filling in the circles beginning at the right hand corner at the bottom. The circles left will shew how thick the plates are left, the circles filled in how much the plates have wasted away.

To show the deterioration of the plates on the starboard side the circles on the index may be coloured blue, and red for the port side of the vessel.

On the index or register will also be shewn the keel, stem and stern post, with the position of every frame and bulk head in the ship or vessel, also the sheathing plates of the hull, or the shell of the boiler, reservoir, or tank, or the mast, or other article, together with the length, breadth, and thickness when new and the distinguishing number or mark on every plate.

A.D. 1872, January 24.—No. 241.

GENESTE, Charles John, of Upper Norwood, in the county of Surrey.—"Improvements in pump "pistons."

This invention relates to the construction of pump pistons in several segments jointed together, which segments are canted by gravity during the descent of the piston, and thereby become slack to the bore of the pump, but during the ascent of the piston they are canted back by the chain rope or rod which works the piston, and thereby are made to fit the bore of the pump.

A.D. 1872, January 24.—No. 242.

HILL, Edward Jacob, of Pimlico, in the county of Middlesex.—"Improved self acting boat detaching "apparatus."

In this boat detaching apparatus I employ the slip hook and ring or depositing apparatus, for which Letters Patent were granted to me April 26th 1870, No. 1007. The 1st improvement consists in an in an arrangement for preventing the slip ring becoming detached until a strain is put on it. Another improvement consists of a sling so arranged in combination with slip rings and slip hooks as to prevent the boat being detached should one end be lifted by a wave, and only when both ends are lifted simultaneously. Two sling arrangements are described, which may also be used in connection with ordinary boat detaching hooks.

A safety pin is applied to the slip hooks to prevent the boats becoming prematurely detached, to be released by hand or automatically.

Another arrangement with a single slip hook is also described, which becomes disengaged as soon as the boat floats.

A.D. 1872, January 25.—No. 243.

BOSSÉ, Henry Charles, of Quebec, in the Dominion of Canada, but now residing at Lay's Hotel, Surrey Street, Strand, in the county of Middlesex, merchant.—(*A communication from Louis La Breche Viger, of Montreal, in the Dominion of Canada, esquire.*)—"A new mode of making cast steel at one operation "of a homogeneous character and of any desired quality."

The novelty which constitutes this invention is the use of the admixture in predetermined and definite proportions of pulverized plumbago, anthracite, charcoal, bituminous coal, coked or in the natural state, compressed or not with pulverized iron ores, oxides, or carbonate of iron, iron sand ore, wrought iron, iron scraps, shavings, clips, and sponge, and metallic iron of any description in a crucible or in a reverberatory furnace or reheating or puddling or air furnace, or with what is known as a Siemens' furnace or in any other furnace heated by gas, to make cast steel of any desired quality in one operation. The mixture, if used in a furnace, to be covered or not with a flux of glass or blast-furnace cinders, or with glass making materials, slabs of soapstone, tiles, bricks, or any other covering, and if the ore or carbon used contains earthy matter, the slags scoriæ which they will furnish may render other coverings unnecessary. In a furnace heated by gas, if a neutral flame, neither oxidizing nor carburizing can be produced, no covering is required.

The above admixture to be used in the following proportions: from two tenths of one per cent. to thirty per cent. and even forty per cent. of said carbon in weight of the ore used, or of the oxide of iron, or carbonate of iron, according to the purity of the oxide or carbonate of iron, and of the carbons used, and according to the quality of the cast steel to be produced. The above admixture, either loose or compressed, with a coating of plumbago or other carbonaceous matters and covered or not with the above-mentioned coverings. To the admixture may be added a small quantity of oxide of manganese, lime, and fluate of lime in equal proportions, wood tar or common glue may be added in compressing. To insure uniformity, the ores and carbons used should be free from all impurities, finely pulverized, thoroughly and uniformly mixed, and when weighed must be dry, and sufficient carbon added to ensure the carburizing of the ores to the required degree.

A.D. 1872, January 25.—No. 244.

MILLAR, Adam, mechanician, of 1, High Holborn, London, in the county of Middlesex.—" An improved " counting apparatus."

Making a counter similar in mechanism to an engine counter, so reduced in size as to be easily held in one hand, the movement of the arm or lever being made by the finger or the thumb.

Combining a counter with a note book.

A.D. 1872, January 25.—No. 245.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Charles Auguste Gapiand, a person resident at Levallois, France, chemist.*)—" A new and improved " process for manufacturing gas for lighting and heating."

This invention consists to extract from liquid coal tar, imperfectly distiled, the gas still contained in the said liquid coal tar, which is decomposed by running upon coke previously red-hotted in a particular retort.

A.D. 1872, January 25.—No. 246.

BOGER, Walter Deeble, of 77, Chancery Lane, in the county of Middlesex, and of Lincoln's Inn, barrister-at-law.—" Improvements in pipes for smoking tobacco."

Between the bowl and mouth piece of the pipe is placed a box or chamber, in which is inserted a plug or filter of tobacco, in order to intercept the passage of the oil of tobacco or nicotine juice, and prevent its passing from the bowl to the mouth-piece.

A.D. 1872, January 25.—No. 247.

ELLIS, Robert Joseph, and DOBSON, George, both of Liverpool, in the county of Lancaster.—" An " improved composition for preventing incrustation and corrosion in steam boilers, and other apparatus " for generating steam."

The features of novelty which constitute this invention consist in using concentrated silicate of soda mixed with solutions of Irish moss and introducing the same into the water of steam boilers for the purposes of preventing corrosion and incrustation. With some waters the concentrated silicate of soda is sufficient without the addition of the solution of Irish moss. The proportion of Irish moss solution when used is one part to four parts of silicate of soda in solution.

A.D. 1872, January 25.—No. 248.

AYLESBURY, Hector, of the city and county of Gloucester, mineral water manufacturer.—" Improve- " ments in stoppers for bottles."

The plug contains a disc or piston which is lowered to admit liquid and raised to close the aperture, in the latter position it is flush with the flange on the neck of the bottle so that no dirt can enter. The stopper is particularly applicable for aërated liquids, but it may be used with others.

A.D. 1872, January 25.—No. 249.

ABRAHAM, George, of Taunton, in the county of Somerset, ironmonger.—" Improvements in the " fittings of window sashes."

This invention consists in fitting to the edges of window sashes plates with holes in them, into which holes rollers mounted in the window frames are pressed by springs, so as to hold the sashes against their weight unless force be applied to them sufficient to cause the rollers to be pushed back out of the holes.

It also consists in fitting such spring rollers with bolts or with means of turning them at right angles so as to make them act as bolts to fasten the sashes.

A.D. 1872, January 25.—No. 250.

NOBBE, Diedrich Anton Adolph, of No. 6, Kenilworth Road, Roman Road, Old Ford, in the county of Middlesex.—" Improvements in fire-escapes."

This invention consists of a barrel mounted above a window head with chain which can be unwound therefrom in case of fire and passed through the window to establish a communication with the exterior, the chain having at intervals links shaped conveniently for the grasp of the hand.

A.D. 1872, January 25.—No. 251.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from William Alanson Clark, of New Haven, Connecticut, United States of " America.*)—" An improved lubricating apparatus."

My invention relates to a lubricator applicable to all kinds of steam machinery, but more especially adapted for use on the valve chests of steam engines; and it consists in a steam chamber or condenser connected to the top of an oil chamber, in such a manner that the water resulting from the condensation of the steam in the upper chamber flows down into a lower chamber and displaces the oil, which escapes through an opening in the top and is conducted by a tube to the parts to be lubricated.

A.D. 1872, January 25.—No. 252.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 35, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from the American Seal-Lock Company, of the city, county, and state of New York, in the United States of America.*)—" Improvements in seal-locks."

The invention consists in constructing a seal lock with two members sliding one upon or within the other, and secured together by a spring catch protected by a seal which must be broken to obtain access to said catch.

A.D. 1872, January 25.—No. 253.

BURR, David Auguste, of Washington city, in the district of Columbia, and United States of America.—(*A communication from William Edgar Pratt, a person resident at Washington city, district of Columbia, United States of America.*)—" An improved diaphragm motor, and its application in automatically operating " valves and levers in low-water detectors, air-compressing machines, supply or discharge pipes, double- " acting vacuum pumps and other hydraulic or pneumatic machines and engines, by means of an intermittent " fluid pressure."

This invention relates to the employment of an enclosed elastic or flexible diaphragm arranged to be operated upon intermittently in opposite directions by the pressure or weight of columns of water or other fluid on each side thereof as a motor.

It relates specially, *second*, to the combination of an enclosed diaphragm with a steam boiler as a safety guard to prevent explosion from low water. In this case one compartment of the diaphragm chamber is made to communicate with the boiler at its low-water mark and the opposite compartment communicates with the boiler much below the low-water line. The diaphragm itself is connected by a rod with a valve in an escape pipe opening into the boiler, and communicating with an alarm whistle or with the fire box, so that when in consequence of low water in the boiler the first pipe on one side of the diaphragm fills with steam the weight of the column of water in the other pipe on the opposite side of the diaphragm will operate to move the diaphragm and open the valve in the escape pipe and allows steam or water to escape and sound an alarm, or if the boiler be promptly refilled to a safe and proper level extinguish the fire.

The invention relates specially, *third*, to the combination of the diaphragm with valves opening pipes for admitting water into an air compressing cylinder and for discharging it therefrom, said valves being operated automatically by the diaphragm under the intermittent pressure of a column of water. When the pressure of this column of water is balanced by an overflow from the cylinder, the diaphragm will, under the influence of a weight or spring, fall and simultaneously open the discharge and close the supply pipe. So soon however as this counterbalancing pressure is removed the diaphragm is forced up to close the discharge and re-open the supply pipe.

The invention relates specially, fourth, to the application of the diaphragm to operate automatically the steam throttle valve in a double-acting steam vacuum pump. The diaphragm chamber is placed between the two cylinders so that its upper compartment shall be connected with the bottom of one cylinder and its lower compartment with the bottom of the other cylinder. A rod from the diaphragm extends up to a valve in the steam pipe so arranged that when the branch pipe to one cylinder is closed the branch pipe to the other shall be opened and vice-versa.

A.D. 1872, January 25.—No. 254.

PRIEDMANN, Alexander, of Vienna, in the Empire of Austria, engineer.—"A new method of and " apparatus for producing a self acting circulation in tubular steam boilers employed for locomotive engines, " and collecting the precipitates of the water of boilers generally."

This invention consists, firstly, in fitting a tube outside the boiler of locomotive engines, one end of the tube communicating with the water remote from the fire box, and the other end with the water surrounding the fire box and near the fire grate; a self acting circulation is thus established. Secondly, in making use of this circulation to receive the deposits or precipitates from the water by interposing in the said tube an apparatus, which the whole circulating water will pass through, and which is adapted to collect the said deposits; this part of the invention applies to boilers generally. Thirdly, in an apparatus to carry out the second part of the invention.

A.D. 1872, January 25.—No. 255.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Ludovic Charles Adrien Joseph Guyot d'Arlincourt, of* 13, *Boulevart St. Martin, Paris.*) —"Improvements in electro magnets, applicable for use in electric and electro-telegraphic apparatus."

This invention relates, first, to novel arrangements of the electro magnet relay previously patented by me, June 23rd, 1869, No. 1920. Secondly, to the several applications of said relay. Thirdly, to several methods described of discharging the line, viz.:—1st, by means of a vibrating pallet, with one portion of the pallet connecting the line with the earth. 2ndly, by means of a current from a local battery acting inversely to the line and passing through supplementary coils. 3rdly, on transmission by a discharge battery and small additional relays, for reducing the current in one or other direction and prevent the line becoming overcharged. Fourthly, to suppressing a discharge or return current by means of any suitable additional relays for producing the effects described.

A.D. 1872, January 25.—No. 256.

CLARK, Robert Dawson, master mariner, and **JOBSON, Robert**, blacksmith, both of West Hartlepool, in the county of Durham.—"An improved detector for ascertaining errors in ships' compasses."

The detector consists of a dial plate marked like an ordinary compass, except that the points indicating east and west are reversed.

This dial is hung in gimbals, with its north and south points in line with the keel, the north point in the direction of the ship's head. A pointer works over this dial, having a sight vane, at which the observer's eye is applied, and the pointer moved until the polar star bears on the tip of the rod, which will indicate on the dial the true course of the ship.

By comparing this with the course indicated by the magnetic compass, the variation is ascertained. With two vanes the bearings of lights may be taken.

A.D. 1872, January 26.—No. 257.

UNGERER, Albert, of Simmering, near Vienna, Austria, chemist.—"An improved process or method " and apparatus for preparing plants to render them useful in the manufacture of paper-pulp."

This invention relates to an improved process or method of and apparatus for preparing or treating plants so as to render them more adaptable or useful in the manufacture of paper pulp; the object of the invention more particularly being to isolate the cells of the plants (but so as entirely to preserve their integrity) and to free them of their natural incrustating substances, as well as to bleach them, so as to render them more adaptable to the said manufacture.

In carrying my invention into practical effect, I prefer that the plants should be first cut in pieces or lengths of convenient size by cutting machines or other suitable means previously to the treatment to which they are subsequently subjected (as herein-after described), but in some cases it will not be necessary that they should be first cut.

The apparatus employed for the above object is constructed and arranged as follows:

It consists essentially of a convenient number of iron boilers (which I term plant boilers) for boiling the plants in communication with each other by iron pipes or tubes provided with suitable cocks, valves or their equivalents, so that the communications may be opened or closed at pleasure Under each of these boilers is placed a firegrate.

In addition to these plant boilers is a separate lye boiler (to prepare hot or boiling lye) in communication with the pipes or tubes of the plant boilers, so that the plant boilers can be filled with the boiling lye direct from the lye boiler as hereafter described.

A water pump is also provided and communicates with the series of plant boilers, so that the latter can be filled with cold water.

The improved process or method of preparing or treating the plants is as follows:

The plant boilers are first filled with the plants and with a previously heated caustic lye at a variable pressure, the height of which as well as the concentration of the lye is dependant upon the nature of the plants being treated; after which I cause cold water to pass through all the plant boilers: the plants are then further treated, according to the purpose they are intended for, or they are bleached, as the case may be.

A.D. 1872, January 26.—No. 258.

TOMKYS, John Law, of Haslingden, in the county of Lancaster, chemist and druggist.—"An improvement in lamps for burning hydro carbon spirit or oils."

This invention consists of an intermediate chamber filled or partly filled with absorbent material between the oil or spirit container and burner, thus avoiding the danger of ignition of the spirit or oil in the container, and yet allowing the full capacity of the container to be made available.

A.D. 1872, January 26.—No. 259.

WALTON, William, of Haughton Vale Works, Denton, near the city of Manchester, wire card manufacturer.—"Improvements in the manufacture of wire cards."

It has heretofore been customary in manufacturing wire cards to use drawn, round, or angle shaped wire, or flat rolled wire; now my invention consists in rolling ordinary round wire into an angular section with rounded ends and then setting the card teeth made from such angular wire into prepared india rubber cloth or other material by means of the usual machinery.

A.D. 1872, January 26.—No. 260.

EVERICKX, Charles Joseph, of 30, Cannon Street, in the city of London, engineer.—"Improvements in the construction of portmanteaus, travelling cases, or boxes for containing clothes and other necessary articles used by travellers."

The portmanteaus, travelling cases, or boxes consist of an outer case made of wood, metal, or other rigid substance and provided with a pair of doors which open on vertical hinges and a hollow lid which is hinged to the back of the case. In this lid are recesses to receive various toilet articles, such as combs, brushes, looking glass, sponge bag or box, or writing materials.

A.D. 1872, January 26.—No. 261.

BOYD, John, and **HENDERSON, William**, both of Castle-Cary, in the county of Somerset.—"Improvements in machinery for weaving hair cloth."

This Provisional Specification describes,—

1. Cams, wheels, and pinions for opening the sheds.
2. Toggle levers for working the batten.

3. The control of the let off by the reed.
4. Nippers passing through the shed and drawing hairs one by one from a bundle.
5. Means of actuating opening and closing such nippers and causing them to take the hairs alternately point and butt.
6. A feeling finger which stops the shedding and let off motions when the nippers fail to take.
7. A modification in which the nippers select the hairs and a hook draws them through.

A.D. 1872, January 26.—No. 262.

WEIR, GEORGE, of Glasgow, in the county of Lanark, North Britain, engineer, and WEIR, JAMES, of Liverpool, in the county of Lancaster, engineer.—" Improvements in steam boilers."

This invention has for its object to increase the durability of steam boilers, and in carrying out the invention a refractory substance such as fire clay is applied to the outside of the tube plates or other plates either by plastering it on or by fixing on slabs or shells of it.

A.D. 1872, January 26.—No. 263.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—*(A communication from Andrew Burgess, of Owego, county of Tioga, state of New York, United States of America.)*—" Improvements in breech loading fire-arms."

This invention consists in the mode of operating the breech block and extractor, and in the construction, arrangement and combination of parts for the same.

The breech block is pivoted so that its forward end may be raised and lowered in loading and discharging the piece. The breech block is connected with the trigger by a toggle joint, to the joint pin of which a hook is attached. Said hook is caused by a spring to engage with a hook on the tumbler, whereby the breech block is drawn down and the empty cartridge shell extracted in the act of cocking, after which the hooks are disengaged by a spring. The breech block is held down by the extractor bar but released on the introduction of a cartridge and thrown up by a spring, its complete closure being effected by the act of pulling the trigger in firing. The extractor is operated by the hammer through the agency of the extractor bar working in a Y groove therein, and acting on a lever hinged to the extractor. The latter is furnished with a cam acted on by a spring to through the discharged shell clear of the piece.

In a modification the tumbler is connected with the breech block by a link in lieu of the toggle joint.

A.D. 1872, January 26.—No. 264.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—*(A communication from Lyman Reed Blake, of Fort Wayne, Indiana, United States of America.)*—" Improvements in machinery for nailing or pegging the soles of boots and shoes to their vamps or " uppers."

This invention relates particularly to improvements in that class of machinery for nailing or pegging the soles of boots and shoes to their vamps or uppers described in the Specification of an invention for which Letters Patent have been granted, bearing date the 20th day of January, A.D. 1868, No. 198. In the present invention each nail when driven is inclined, and the nails of the row are alternately inclined, the inclinations being in the line of the seam. It is held in a vertical position (as regards the seam or plane of the fastenings) and is driven by a driver positioned and moving in the line of each nail so held, and the inclination is obtained by so cutting or forming the point of each nail, that it assumes the requisite inclination as it enters the sole, and the points of alternate nails are preferably so formed that one enters and then slants in one direction, and the next enters and then slants in the opposite direction in the line of the series of fastenings. There is a swinging nail-tube-plate pivotted on a stud pin and swinging from position where the wire enters it, and the nail is cut off to position under the driver, the pivot-pin being near the lower end of the swinging nail-tube-plate, so that while the nail-receiving end of the plate has a very considerable motion to carry it from the wire-receiving and nail-cutting line into the line of the driver, the lower point of the nail-tube-foot has but a slight movement.

CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 27 to February 2, 1872.

A.D. 1872, January 27.—No. 265.

MIDDLETON, John, of Hartlepool, in the county of Durham, ships' compass adjuster.—"A new or "improved apparatus for adjusting or correcting ships' compasses by observation of the celestial bodies as "well as terrestrial objects."

The novelty of the invention is that the apparatus or instrument enables any person on board a sailing or steam vessel, with very little knowledge of navigation, to adjust the ship's compasses in one minute either at night or in the day time and in all latitudes.

A.D. 1872, January 27.—No. 266.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from A. R. Morgan, of the city and state of New York, United States of America.*)—"Certain improvements in kilns for burning bricks, tiles, and pottery, and in the mode "of utilizing the heat generated therein."

The kiln, which is the subject of the improvements herein-after described, is of that class in which the heated air and products of combustion are introduced to the chambers containing the articles to be burned at the top, and caused to flow downward through the bottom.

A.D. 1872, January 27.—No. 267.

WOODWARD, James, the younger, of St. James's Street, in the city of Westminster, gun maker, and **EMME, John**, of Crown Street, Soho, in the county of Middlesex, breech-loading action maker.—"Improvements in breech-loading fire-arms."

This invention relates to certain improvements upon the invention for which Letters Patent were granted to Edwin Charles Hodges, bearing date the 31st day of January, A.D. 1871, No. 251.

The invention therein described consisted firstly in the addition of two pins to the sliding bolt (which engaged with two square projections on the barrel lump), for the purpose of giving greater security in locking the barrel; and secondly in providing the upper surface of the bolt with a projecting incline (acted upon by an incline on the barrel lump), for getting rid of the unpleasant jerking theretofore usual when the breech of the barrels was being closed.

The object of this invention is to attain the same objects by the following improvements.

We do away with the incline on the lump and with the incline projection on the sliding bolt, and substitute for the last a small box like projecting piece for steadying the action and working of the sliding bolt; and we form the bolt and pins in one piece instead of securing them together by screws, and lengthen the pins, and slightly curve the upper part of the face of each; and we form the projections of a somewhat triangular section with curved faces, and pass them through the hook like or front lump of the barrels instead of the rear lump and so nearer the fulcrum pin on which the barrels hang, so that during the whole action of closing the barrels the rear curved faces of the triangular projections bear against the upper curved portions of the faces of the elongated pins of the bolt, and so gradually force the same backwards till they clear the same, when by the action of a spring the bolt is forced forward and so securely holds the barrels, whilst by the same means the desired object of closing the breech without the usual jerking is effected.

A.D. 1872, January 27.—No. 268.

MACOMBER, David Oliver, of Utica, New York, United States of America, now of Arundel Street, Strand, in the county of Middlesex, civil engineer.—"Improvements in the manufacture of ordnance."

The said invention relates to the construction of ordnance of sections of wrought iron welded together.

The said sections are set or expanded either before or after welding together by pressure from the centre, until the strain of such pressure is equalised between the inner and outer surface of said sections or gun. The chamber for containing the powder, which is enlarged, is closed at the rear with a screw. A gas-check, formed of a steel or other metal barrel or open cone, is made to fit the rear of the breech chamber. The charge may be fired by a needle or by the usual fusee.

A.D. 1872, January 27.—No. 269.

BOSTEL, Daniel Thomas, of No. 21, Ship Street, Brighton, in the county of Sussex.—"Improvements "in what are known as 'dry earth closets' and 'urinals.'"

According to this Provisional Specification the pan of the closet is formed of such a shape that the solid and liquid excreta are kept separate the one from the other, and are caused to pass away into separate receivers. An earth measuring apparatus is also described which is applicable both to "earth closets" and "earth urinals."

A.D. 1872, January 27.—No. 270.

ANNANDALE, Alexander, the younger, of the Beltonford Paper Mills, Dunbar, North Britain.—"Improvements in the manufacture of paper and in machinery or appliances for the purpose."

This invention relates, 1stly, to the treatment of paper-making fibres in the state technically called half-stuff, whereby they can be pressed or freed from liquid or moisture more quickly and thoroughly than heretofore.

2ndly. To the treatment of paper pulp, whereby it is freed from knots or impurities.

3rdly. To the construction and arrangement of machinery to affect this.

4thly. To means of renewing the surface and slits of damaged or worn out knotter plates.

5thly. To making new strainer plates.

A.D. 1872, January 29.—No. 271.

ENNOR, Nicholas, of New Cross, in the county of Kent, mining engineer. — "Improvements in "machinery or apparatus for crushing, stamping, or pulverizing ores and other substances, parts of "which improvements are applicable for lifting, winding, and other purposes."

One or more series of stamps worked by lever arrangement, which is also applicable to pumping and other purposes. The grates for the stamps are of saddle back shape.

A.D. 1872, January 29.—No. 272.

WALKER, William Glen, of Helensburgh, in the county of Dumbarton, North Britain.—"Improvements "in preserving food."

The feature of novelty which constitutes this invention is the placing of the refrigerating apparatus within the compartments wherein the food is stored for preservation, the machine being permanently kept there, thus avoiding the loss of cooling effect as in the modes hitherto adopted, where the refrigerating mechanism is operated outside the insulated compartments.

A.D. 1872, January 29.—No. 273.

MYERS, Michael, of Liverpool, in the county of Lancaster, cap manufacturer.—"Improvements in the "manufacture of caps and other like coverings for the head.

Consists in substituting a woven woollen fabric felted into the required form in lieu of the knitted fabrics now used for the purposes indicated in the title, and producing the articles without seam.

A.D. 1872, January 29.—No. 274.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Jean Baptiste Marie Prosper Closson, of Paris, in the Republic of France.*)—"An improved method of and apparatus for transmitting motion or motive power to variable "distances."

The object of the present invention is to substitute for the usual driving bands or rods another transmitting agent which will admit of the distance between the driver and the machine to be driven being varied at pleasure. The agent employed for this purpose is either a liquid such as water, or a fluid such as compressed air or gas.

A.D. 1872, January 29.—No. 275.

MURDOCH, Hunter Henry, of No. 7, Staple Inn, in the county of Middlesex, patent agent.—(*A communication from Marco Maroni, of Turin, Italy, chief engineer to the Alta Italia Railway Company.*— " An improved gas lamp for illuminating the interiors of railway and other carriages or places where, under " ordinary circumstances, motion causes unsteadiness or flickering of the gas jet or flame."

The lamp consists of a cylindrical metal case having a globe of glass at the lower part which is supported by a curved gas pipe carrying a burner, the globe being secured to the gas pipe by a bracket, the aperture at the lower part of the globe being partially closed by a plate. A perforated diaphragm is fixed in the lamp case above the globe, and perforations are made in the cylindrical case.

The cover of the lamp, which is partly conical, is perforated, and carries in the inside a tube, to the lower end of which a reflector is fixed, having an opening in the centre through which air passes to and through the aforesaid tube. When the lamp is closed the reflector is pressed against the perforated diaphragm by a spring.

A.D. 1872, January 29.—No. 276.

GLASSPOOL, Richard, of Hemel Hempstead, in the county of Herts.—(*A communication from Thomas Glasspool, of Minneapolis, state of Minnesota, United States of America.*)—" Improved alarum, indicating and " silent feed apparatus for flour and grist mills."

This invention relates, 1st, to an automatically acting means of calling the attention of the attendant when the supply of corn or other grain falls short and when the stone is not running at a proper speed; and, 2ndly, to a means of equally distributing the grain to the stones.

It consists of a vertical spindle fitted into the eye of the running stone and rotating therewith. On said spindle is mounted a governor provided with tappets, which come into contact with a rod or lever acting on a bell when the stone is running above or below its proper speed. The grain is fed in through a funnel, through which the spindle passes, and in the funnel is a small piece of leather connected to a small tongue affixed to the rod on which the tappets act. The vertical spindle is stepped into the rynd of the running stone, which is saucer shaped, and to which the grain is conducted by the funnel, the said saucer being provided with a number of radial arms for distributing the grain.

A.D. 1872, January 29.—No. 277.

WOODS, John Edward Tenison, of 55, Camberwell Grove, parish of Camberwell, county of Surrey, chemical engineer.—" Improvements in reverberatory and other furnaces for chemical purposes."

In constructing the fire-bridge of the furnace hollow, and fixing therein a steam and air pipe to force air over the hearth.

A.D. 1872, January 30.—No. 278.

SAUNDERS, Robert, of Croydon, in the county of Surrey.—" Improvements in anchors and their " accessories."

The features of novelty which constitute this invention, consist; Firstly, of building the shanks of stockless anchors of templates of plate iron bolted, or strapped together with a suitable opening in the crown end to admit of the arms or flukes. The palms of the arms or flukes are pointed and supplied with extra wings or spurs, sliding on the arc of the arm to give additional holding power. The cable end of the shank is fitted with a rest, projecting about a foot on each side of the anchor, to give the flukes the proper degree of pitch, the flukes swinging from side to side and both taking into the ground at once. Secondly, a modified form of mushroom anchor, scollop shaped, or in the shape of an elongated parachute, stiffened with angle or T-iron, and used for mooring purposes. Thirdly, in a shank with a slot cut up some distance from the crown end, to which is hinged a swinging arm, or spur, swinging from side to side, and kept in the right degree of pitch by stops. Fourthly, to an accessory to the holding power of the anchor, and mitigating the sudden strains or shocks on the cable, consisting of a self acting friction break, or controller, attached between buffers of elastic substance, the whole acting on a block or frame on the deck, the cable also being led from thence round chain guide wheels acted upon by cog wheels and worked by a capstan.

A.D. 1872, January 30.—No. 279.

LAKE, William Robert, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London.—(*A communication from Emil Friedrich August Schott, of Seesen, Germany, chemist.*)—"An "improved gypsum cement."

I reduce natural anhydrite by any known mechanism to a coarse grained powder or a finer one, and mix it with 73, 5°/$_{0}$ of limestone, powder, or chalk. The mixture thus obtained is heated on the body of a puddling furnace, so that it becomes liquid, and then it is crutched by iron tools through a side opening and cooled. The furnace is then again filled up. To melt the mixture I use the well known furnace of Siemens, as it is employed to puddle pig-iron, or any other furnace by which a temperature of 2000° C. can be obtained, the melting of the mixture being only obtained at full white heat.

A.D. 1872, January 30.—No. 280.

ELLIS, George Henry, of No. 20, High Holborn, in the county of Middlesex, engineer.—"Improve- "ments in the construction of horse shoes."

The novelty consists in making the shoes in two or more pieces with a joint at the toe having projecting pieces or ears (with small spikes) for going round and fitting upon the hoof in manner substantially as described.

Also in providing wearing plates to fix upon the above jointed plates or shoe, which may be easily removed (when worn) and replaced.

A.D. 1872, January 30.—No. 281.

QUICK, Charles, of No. 4, Rosedale Cottages, Albion Road, Hammersmith, and NORMINTON, Edwin Napoleon, of 38, High Street, Camden Town, both in the county of Middlesex.—"Improvements "in carriages."

The front driving seat is hinged near the coachman's heels, so as when thrown forward it gains sufficient room for the front pillars and a portion of the roof of a single or double seated carriage to fall forward and lie flat on the straight part of the boot; the seat is then thrown back in its place which falls on the lamp irons which has an iron on either side of the seat with a hole in the end of same which falls on spindles in connection with the lamp irons, and thereby secures the seat in its original position; the doors are made to slip off the hinges, thereby rendering it a perfect open carriage; by these contrivances it forms three different sort of carriages, in either case representing a single seated close carriage, a single seated open sandaulet, and also when the doors are removed form a Victoria sandaulet; in the second place we form a double seated close carriage, a double seated open carriage, and by the removal of the doors we form a double seated Victoria sandaulet.

A.D. 1872, January 30.—No. 282.

BOX, John, of Newton House, Newton Road, in the county of Middlesex, civil engineer.—"A new and "improved method of and apparatus for preparing and condensing peat for fuel without moulding or "pressing, and also for a new and improved oven for making peat charcoal."

The peat is completely disintegrated in a mill called a disintegrator working in sufficient water to cause it to form a pulp of the consistency of paper pulp.

It is then passed through a kind of sieve or strainer to remove all ligneous and other extraneous substances and conducted into carefully drained reservoirs.

When drained to the consistency of clay as prepared for moulding bricks it is cut into oblong squares.

When sufficiently dry to be handled it is removed to racks or frames to harden.

The oven consists of two, three, or more cylinders of plate iron the diameter of each being 5 times the height.

The top cylinder diminishes in size at the top to nearly one third of the diameter of the bottom, and a cap is placed on the top also of iron plate. Proper openings with doors are arranged to give air. When in use the cylinders placed one on the top of the other are set over a hole dug in the ground of a diameter rather less than the cylinders. The peat is then packed inside by a man who has a knowledge of charcoal burning who attends to the fire.

A.D. 1872, January 30.—No. 283.

RIPLEY, Henry William, of Bradford, in the county of York, dyer.—(*A communication from Charles Depoully, of Paris, France.*)—" Improvements in coloring fabrics."

This invention relates to improvements on the process patented by C. E. Brooman, dated August 19th, 1867, whereby coloring liquor is delivered on to fabrics in the form of mist or fine spray. It is now proposed to discharge or deposit liquids upon fibrous substances by the use of means which will ensure a more reliable result than could be obtained by the process referred to.

A.D. 1872, January 30.—No. 284.

ROWAN, Samuel, of 92, Fawcett Street, Sheffield, in the county of York, silversmith.—" Improvements " in the manufacture of joints or hinges, and in the machinery to be employed therein."

According to this invention the wire is drawn in one solid piece or section including the round portions of the joint which are then cut at suitable intervals so as entirely to remove sections thereof leaving the solid parts to form dovetails with the corresponding spaces, when two bars thus treated are placed together to form a hinge.

The wire or bar is then cut into suitable lengths by a circular saw or other means, and the parts set in a vice and brought under the action of rotating cutters which remove further portions of the metal between the dovetails; and then an oscillating chisel cuts a semicircular channel or groove to receive the round edge or bead of the corresponding half of the hinge.

Finally the hinges are pierced and pinned.

A.D. 1872, January 30.—No. 285.

LAST, Samuel, of Grafton Street, Mile End, in the county of Middlesex, foreman cooper.—" Improvements " in apparatus for cutting and planing wood, and other like substances."

This invention consists of a combined circular saw and rotatory plane, whereby the rough saw marks are removed from the wood or other material, being cut simultaneously with the sawing operation, the side or sides of the saw containing plane cutters for that purpose.

A.D. 1872, January 30.—No. 286.

PIGOTT, George West Royston, of Notting Hill, London, in the county of Middlesex.—" Improve- " ments in covered wire, and in the means or apparatus for effecting the same."

The object of the first part of the invention is to prevent oxidation or rusting of the wire, which is effected by first causing it to pass through a bath of melted tin or zinc; or, if iron wire, it may pass through a bath of sulphate of copper or alloy of lead and tin, and subsequently through a solution of gutta-percha, india rubber, or other insulating or adhesive matters. Wire thus prepared is then covered with thread or yarn of any suitable or desirable fibrous substances by the usual means or by means described in the second part of this my said invention, which consists in the employment of a hollow spindle mounted in a suitable frame and capable of rotating at a high velocity, one end of the said spindle projecting and tapered to receive a bobbin of the thread or yarn to be used as a covering of the wire, which is caused to pass through the hollow spindle. This taper part of the spindle has an adjustable collar at each end so that the bobbin may turn smoothly. This spindle also carries a flyer for lapping the thread upon the wire.

To avoid the use of oil or other lubricant to these spindles, I use " lignum vitae " wood for the bearings, & may also use it to bush the bobbins with.

A.D. 1872, January 30.—No. 287.

BAKER, Francis Robert of Leamington, in the county of Warwick, vulcanite manufacturer.—" New or " improved machinery or apparatus for placing driving bands on the pulleys or drums of shafting, while the " said pulleys or drums are in motion."

The object of this invention is to afford a simple, safe, and expeditious means of placing driving bands on their pulleys while the latter are in motion, and to obviate the accidents to the person which commonly occur in placing the said bands on their pulleys.

The apparatus constructed according to this invention consists of a collar loose upon the shaft situated near the pulley, the said collar carrying an arm which hangs vertically from the shaft, and near to but not touching the face of the pulley. At the top of the said arm is an incline of a length considerably greater than the breadth of the driving band. The incline terminates in a short rod. The loose collar is retained in its place on the shaft by collars. When the band slips from its pulley, the loop which went over the pulley falls upon and is caught by the rotating shaft. To restore the slipped band to its place on the pulley the arm is raised from its pendant position, the incline passing under the loop of the band. The raising of the arm is continued until it has described a semicircle, when the incline presents its lowest point opposite the highest point of the rotating pulley, and the band slips down the said incline on to the pulley. The arm and parts carried by it are then allowed to resume their normal or pendent position.

The parts described may be situated on either side the pulley and connected together by a rod, so that by raising the apparatus the band may be restored to its place on the pulley, on whichever side of the pulley it may have slipped off.

A.D. 1872, January 30.—No. 288.

SEYMOUR, Philip William, of Hallsville Road, Canning Town, in the county of Essex.—" Improvements in the construction of portable magnets to be employed for curative and other purposes."

The invention consists in embedding strips of iron in india rubber, said strips being afterwards magnetised.

A.D. 1872, January 31.—No. 289.

WARD, John, of Number 44, Goodge Street, Tottenham Court Road, in the parish of St. Pancras, London. —" Improvements in the mode and means for securing earrings to the ears."

A little clasp to hinge from the tops of earings to hold or grasp the wire under the lobe of the ear.

A.D. 1872, January 31.—No. 290.

SMITH, William Ford, and COVENTRY, Arthur, of Gresley Iron Works, Salford, in the county of Lancaster, engineers and tool makers.—" Improvements in planing machines."

The invention consists in an improved arrangement and combination of mechanism. The table does not work in Vs but on flat horizontal surfaces, lateral movement being prevented by vertical surfaces, the table being actuated by a toothed rack. The vertical surfaces are lubricated by disc pulleys working against the faces and with their lower edges in reservoirs of oil or by other means. The two finger tumbler lever is mounted on the end of a vertical shaft, and gives motion, through an arm and rod, to the belt guide for reversing the table, and by another arm and rod to an arm on a vertical shaft for selfacting the feed and lifting the cutter away from the work on the return stroke. The invention also consists in arrangements of wheels which can be brought into gear when required to change the cutting speed of the table without changing the back speed.

A.D. 1872, January 31.—No. 291.

BARTHELMES, Eduard, of Berlin, in the Kingdom of Prussia.—" Certain improvements in shuttle-sewing machines."

This invention relates :—

Firstly. To a mode of feeding the cloth by square motion, whereby a more regular stitch is formed than by the ordinary methods of moving the cloth.

Secondly. To a peculiar construction of shuttle which will allow of any desired tension being given to the thread, and the tension to be continued up to the last end of the thread.

Thirdly. To a mechanism called " vibrator " for lifting the cloth-presser temporarily, so that when executing ornamental work, the necessary short movements may be made without damaging the cloth.

Lastly. To a needle-holder for fastening shankless needles, which are very cheap in comparison with those having shank.

A.D. 1872, January 31.—No. 292.

DOBSON, Benjamin, RUSHTON, Thomas Henry, and DOBSON, William, all of Bolton, in the county of Lancaster, machine makers.—" Improvements in machinery for ginning cotton."

This invention consists in certain improvements upon the machinery for which Letters Patent were granted to Christopher Brakell, William Hoehl, and William Günther on the 23rd day of January 1865, No. 191, consisting principally of a knife roller, a delivering roller, and a doctor knife; now our invention consists in certain improved modes of constructing the said parts of cotton gins, to increase the production of the machines.

A.D. 1872, January 31.—No. 293.

JOHNSON, Robert, of Bradford, in the county of York.—" Improvements in the mode of and apparatus " for drying and superheating steam."

My invention consists in drying and superheating steam by causing it to circulate through pipes or chambers placed within the boiler before it is taken to the pipe which conveys it to the steam engine.

A.D. 1872, January 31.—No. 294.

KNOWLES, James, of Eagley Bank, near Bolton, in the county of Lancaster, coal proprietor.—" An " improved instrument for rooting up weeds."

This instrument consists of a pair of pointed levers jointed to a stud and connected to handles. To the stud is fixed a block of wood or other material, which serves as a fulcrum on pressing down the handles to raise the weed out of the ground.

A.D. 1872, January 31.—No. 295.

PIEDBŒUF, Gustave, of Japille, near Liége, in the Kingdom of Belgium, and of 1, Seymour Chambers, Adelphi, W.C., London, engineer.—" Improvements in apparatus for the manufacture of steam boilers."

These improvements relate to the apparatus described in Specification No. 351, A.D. 1870. The matrix for flanging the edges of the plates against the upper fixed die is made tubular with a moveable bottom. This matrix is propelled upwards by the main plunger of the press. The moveable bottom serves to additionally fashion in any way the main body of the plate and to hold it up while being flanged against the fixed upper die. It is propelled upwards by four smaller independent hydraulic plungers.

A.D. 1872, January 31.—No. 296.

COOPER, John, of Birmingham, in the county of Warwick, iron founder.—" Improvements in moulding " boxes used in making moulds for casting metals."

This invention consists in providing the moulding box with a series of loose fitting metallic linings, the said linings being fixed to and liberated from the moulding box at pleasure by means of screws, wedges, or other fastenings.

The linings described are made in halves and after being dropped into the two halves of the moulding box are secured thereto by the fastenings described. The sand is then rammed in the lined half mould boxes and the half moulds formed in the ordinary way. The two half mould boxes are then fitted together and the fastenings of the linings relaxed, so as to disconnect them from the half mould boxes. The half mould boxes are then removed leaving the two half moulds upon one another in their proper positions supported by the linings. The mould is now ready to be used in the ordinary way for casting. By this invention any number of moulds may be made by the use of one moulding box provided with linings and fixing apparatus for the same.

A.D. 1872, January 31.—No. 297.

EDWARDS, John, of Cassland Crescent, South Hackney, in the county of Middlesex.—" Improvements " in the permanent way of railways."

Constructing sleepers, whether of wood or iron, with raised platforms at each end. Connecting the tie bars direct to the chair, chair being furnished with a lug if desired. Applying a piece of wood to the ends of ordinary sleepers in order to preserve the gauge. Also forming chairs of wrought and cast iron combined or of wrought iron formed out of what is termed "gutter iron," the rails being dropped and bolted into the chairs.

A.D. 1872, January 31.—No. 298.

WIGZELL, Montague, of 24, George Street, Croydon, in the county Surrey, artist.—" A new or improved drawing board for the purpose of stretching drawing paper (or other materials for drawing, tracing, " or painting upon), on one or both of its sides."

The features of novelty in this my invention are as follows:

Having a groove or grooves or indentations in one or both of the flat surfaces of the said drawing board for the purpose of pressing the edges of the paper or other material to be stretched, down into when wet or dry, and holding the said edges in the said grooves or indentations by means of strips of wire, thin iron, string, wood, metal, or other material of a soft or elastic nature, so that the paper or other material can be quickly & easily stretched over or upon the centre of the board enclosed by the grooves, and having the holding down pieces and their fastenings partly or entirely counter-sunk in the same surface of the board over or upon which the paper or other material is stretched.

A.D. 1872, January 31.—No. 299.

STEELE, James, of Sparkbrook, in the county of Warwick, engineer.—"An improved claw wrench for "screwing gas pipes and for other similar purposes."

I construct a claw wrench in which the jaws do not open or close, but are permanently decided in shape and size, and consist, indeed, in a taper or wedge shaped opening or groove being formed in the head of the spanner or wrench, one side of these fixed jaws having a plain surface and the other having teeth cut on its surface, in order to afford the necessary grip or hold for the material when placed between the said jaws.

A.D. 1872, January 31.—No. 300.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Joseph Count de Lusini Ruiseco, of* 13, *Boulevart St. Martin, Paris.*)—"An improvement "in cigarettes."

The improvement consists in the application of rattan, reed, cane, or other like vegetable stems (when barked or decorticated, or the pith or interior substance of the same), having capillary channels as mouthpieces for cigarettes.

A.D. 1872, January 31.—No. 301.

AMIES, Jane, of Guernsey, one of the Channel Islands.—"Improvements in foot-warmers."

The foot-warmer is made of a shape more or less resembling a slipper, and consists of an inner and an outer shell, the space between the two containing hot water.

A.D. 1872, January 31.—No. 302.

WOOD, Charles, of the Tees Iron Works, Middlesbrough-on-Tees, in the county of York.—"Improvements in apparatus for cooling blast furnace or smelting furnace slag or scoria as it runs from the furnace, "and loading the same into wagons or trucks in a solid state."

According to this Provisional Specification the slag is caused to flow on to a circular revolving table or trough, on which it solidifies. The table or trough carries it round to a fixed scraper, which removes it from the table or trough and directs it into waggons.

A.D. 1872, January 31.—No. 303.

WILLIAMS, John Avery Branton, of Cardiff, in the county of Glamorgan, civil engineer.—"Improvements in stoves for drying artificial fuel and other substances."

According to this Provisional Specification hot-air flues are formed below at the side of and above the furnace flues. Air is heated in these flues and admitted into the drying chamber.

A.D. 1872, January 31.—No. 304.

RAULT, Leon, and **CHASSAN, Eugène**, of Rue du Four St. Germain, No. 70, Paris, agents of telegraphic lines.—"Improvements in telegraphic printing apparatus."

The printing is accomplished by causing the band of paper to pass over the point of junction of the two halves of a divided hollow cylinder filled with ink, which leaks through the division and thus marks the paper.

The armature is regulated by a spring which receives its action from a cam mounted on an axis actuated be a button. The spring is more or less stretched in proportion as a part of the cam more or less near its centre is presented to it.

A.D. 1872, January 31.—No. 305.

JAQUES, James Archibald, of Tottenham, in the county of Middlesex, chemist, and **BANKS**, John, of Colney Hatch Road, Wood Green, in the same county, surgical instrument maker.—"Improvements in "the manufacture of surgical instruments."

Our invention consists in making œsophagus tubes and bougies, rectum, vagina, uterus, uretha, eustachian, nassal, and other tubes of hard and soft rubber combined.

A.D. 1872, January 31.—No. 306.

SPRAGUE, John Daniel, of Bolinghill, Beulah Hill, Upper Norwood, in the county of Surrey, gentleman. —"Improved apparatus for sweeping or cleaning roads, ways, pavements, paths, and floors or surfaces."

The improved apparatus consists mainly of a sheet of vulcanized or mineralize rubber which is rolled up on a lath rod or bar and placed in a hollow cylinder composed of two half cylinders hinged together longitudinally and provided at its open part with longitudinally lips or flanges between which the end of the sheet of rubber is made to project about 2 inches and is nipped and held fast by the pressure of spring clips or tightening screws.

A.D. 1872, January 31.—No. 307.

PETRIE, John, junior, of Rochdale, in the county of Lancaster, machine maker.—"Improvements "applicable to machinery for washing or scouring and drying wool and other fibrous materials."

This invention relates, firstly, to apparatus designed to take the place of "brats" or other such arrangement used for conveying the fibrous material to or from or out of the washing or scouring machine. For conveying the materials in drying machines the same apparatus is employed, and when fans are used swing doors are adapted to the air passages.

A.D. 1872, January 31.—No. 308.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Samuel Washington Harris, of Hudson, in the state of New York, United States of America.*)—"Improvements in furnaces for the smelting of iron and other ores."

The improvements consist in providing the top of the furnace with a cover, in or under which are one or more pendent doors, which are capable of swinging open for the introduction of the ore, fuel, and flux into the furnace, but of closing immediately after charging.

A.D. 1872, January 31.—No. 309.

PARKER-RHODES, Charles Elmes, of Brixton, in the county of Surrey, gentleman, late of the British Consular Service.—"Improvements in the construction of military and other boots and shoes or coverings "for the feet and legs."

This invention relates to the construction of a boot, shoe, or foot, or foot and leg covering, which is capable of adjustment at any moment to the foot. Between the inner and outer soles is inserted an intermediate sole of leather-cloth or other waterproof material. A wooden heel is secured thereto faced with a wearing surface of leather, which is secured by screws (by preference), which enables the wearer to replace the same when worn out. The upper (made in one or more pieces) is secured (by preference) by screws between the inner sole of leather-cloth or other waterproof material and the outer sole.

The inventor adds a vamp shield reaching above the instep, or a toe cap secured between outer and clump soles. The upper is secured over the outside (as also the vamp shield or toe-cap) by means of eyes and buttons, through and partly around which a single lace is passed and fastened at the upper part.

A.D. 1872, January 31.—No. 310.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Theodore M. Tucker, of Newark, New Jersey, in the United States of America.*) —"Improvements in fluting or crimping machines."

This invention consists in the combination of a self acting cam or eccentric with a moveable frame carrying the top roller of a crimping or fluting machine, for the purpose of propping up the same when elevated for the introduction or removal of the goods. The moveable frame is pressed down by springs and is elevated by a pinion and rack.

A.D. 1872, January 31.—No. 311.

McDOUGALL, Arthur, of the firm of McDougall Brothers, manufacturing chemists, Manchester & London.—"Improvements in the manufacture of common salt."

My improvements consist in the use of high pressure steam contained in pipes of small diameter for the evaporation of brine to produce common salt.

A.D. 1872, January 31.—No. 312.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Louis François Alexandre Arson, of Paris in the Republic of France.*)—"Improvements "in apparatus or means for correcting or compensating for the deviations of the mariners' compass."

According to this invention it is proposed to employ a permanent magnet composed by preference of steel wires contained within a sheath placed vertically near the needle of the compass and capable of rising and falling by the action of an eccentric or cane, which is rotated by gearing so arranged as that the said eccentric will make two revolutions for one complete revolution of the ship. Thus the eccentric will make a complete revolution whilst the ship turns from north to south, and the magnet will present its upper pole to the point nearest to the needle; when the ship turns to the east or to the west and to the point fartherest removed from the needle when the ship turns to the north or south.

A.D. 1872, January 31.—No. 313.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Clement Roswag and Alfred Nicolle Pauville, both of Paris, in the Republic of France.*)—"Improvements in separating gold and silver from lead containing the same."

This invention consists of certain peculiar metalurgical processes which have for their object the extracting from argentiferous or auriferous lead of the precious metal contained therein, whether silver or gold or both, by the aid of any metallic reagent such as zinc, magnesium, aluminium, or the alloys of their two latter metals with zinc, and lastly by mercury.

Hitherto the zinc employed as a reagent has been positively lost, but by regenerating the zinc or any other metallic reagent performing the same functions lead can be desilverized at the same cost whatever proportion of the precious metal it may contain, and an enormous reduction in the net cost of desilverizing is effected.

The essential features therefore of one part of the invention are the application and use of magnesium or aluminium either separately or alloyed with zinc in the treatment of pig lead with a view to desilverizing the same, also the treatment with mercury of the rich scum, whether such scum be obtained by the metals above mentioned and their alloys with zinc or by zinc alone, and in the last case whether oxydised or not.

The essential features of another part of the invention consist in regenerating.

1st. The mercury used for the treatment of the rich scum whether oxydised or not.

2ndly. The argentiferous lead which contains the whole of the silver that the zinc has extracted from the pig lead, and which in a small proportion entered into the composition of the scum after its eliquation.

3rdly. The zinc which has served as the extractor or in lieu thereof the aluminium and magnesium which have performed the same functions either separately or alloyed with zinc.

Aluminium when employed alone is separated in the operation of amalgation.

All that has been hereinbefore stated with respect to silver is perfectly applicable to gold and to the alloy of these two precious metals when they are found together in the lead to be desilverized.

A.D. 1872, January 31.—No. 314.

GIBBS, William Alfred, of Gillwell Park, Sewardstone, in the county of Essex, gentleman, and **BORWICK, Alfred**, of Lloyd's, in the city of London, gentleman.—"Improvements in apparatus and "arrangements for drying."

This invention consists firstly in the combination of a revolving cylinder and air duct of the kind described in Gibbs's Specification, No. 2145, in the year of our Lord 1870, with an air chamber which communicates with the discharged end of the cylinder, hot air being passed through the cylinder and through the chamber. The air duct may be stationary or it may be caused to revolve, and it may have one slit or several slits.

The revolving case may be mounted in a casing or chamber so arranged that hot air may circulate through the interior of the said case and around its exterior, Scrapers carried by the air ducts or otherwise are used when required to detach the substance being dried from the cylinder.

In some cases the substance being dried is passed through a heated metal case or double floor before being fed into the cylinder.

In connection with the arrangement first described, a smaller revolving case set in the hot air chamber may be used to complete the drying of the substance after it has passed through the first cylinder.

The draught over the drying floor may be increased by a current of air passed through a coiled pipe set in the air chamber hereinbefore described.

When noxious gases are given off by the substance being dried, they may be passed through a furnace and thereby destroyed.

Several revolving cylinders of the kind described may be combined with one drying floor and hot air chamber.

Instead of a revolving cylinder, an open trough, either stationary or oscillating and furnished with the air duct, may be used, the substance to be dried being moved as required by an endless web or creeper, or by an endless chain provided with tines, or by tines moved by chains.

In drying some substances such as hay, the trough may be set at an angle, so as to deliver them on to a stack or upper floor.

The trough or cylinder may sometimes be dispensed with, the hay or other substances to be dried being strewn on the ground at each side of the air duct, and shaken up by forks suspended from and actuated by levers affixed to a rocking shaft, or by tines carried by an axis, which is caused to travel backwards and forwards on a suitable frame.

When sheaves are to be dried, they are spiked on vertical perforated pipes branching out of horizontal pipes, through which hot air is forced.

A.D. 1872, February 1.—No. 315.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Enoch Provolt Terrell, mechanic, David Bradley Allen, physician, and John Enoch, farmer, all of West Liberty, Ohio, United States of America.*)—"Improvements in the shuttle-" operating mechanism of looms for weaving."

This invention consists in novel means for operating the picker staffs as hereinafter more fully described. I use a single central obliquely grooved cylinder with a single lever and links for the alternate outward operation only of the picker staff. Springs are arranged to operate the picker staffs by expansion, and these springs and the links alternately draw inwardly the lower ends of the picker staffs and release them previous to their throwing the shuttle. Jointed spring levers are so arranged, in combination with the picker staff under the slay board, that the picker staffs themselves, which are retained in an outward position by said levers, automatically release each other alternately at the proper moment.

A.D. 1872, February 1.—No. 316.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Gormly Myers, of the city and state of New York, United States of America.*)—"An improved apparatus for detecting leakages in gas and water pipes and other like fittings " or connections."

In my improved apparatus I use a steel diaphragm gauge provided with a brass cap, and with a cock which has a cup placed above it for the reception of ether to be forced through the cock into the pipe. The ether can be poured into the cup without disconnecting any of the joints. The said cock is secured at one end of a short tube whose other end is formed with a screw coupling designed to be attached to the pipe to be tested. The lower end of the cock is also formed with a screw connection for making a tight joint with a flexible pipe which connects the said pipe with a force pump. The passages in the plug of the cock are so arranged in combination with the passages of the cock and gauge that the said plug may be turned either to open or close the communication between the gauge and the force pump, and also to open or close the communication between the ether cup and the gas pipe with which the apparatus is connected.

A.D. 1872, February 1.—No. 317.

WELDON, Walter, of 29, The Cedars, Putney, in the county of Surrey.—"Improvements in the manu-" facture of chlorine, and in apparatus and arrangements for that purpose."

This invention relates to the manufacture of chlorine by means of manganite of magnesium, and certain other similar compounds, perpetually regenerated by the dry way. It consists in treating those compounds with hydrochloric acid, so as to obtain strong chlorine and neutral residual liquors; in then evaporating those liquors down to a certain point in iron pots by the waste heat of the furnace subsequently employed; in then completing their evaporation to dryness in a furnace; in then heating the dried residue with access of air, thereby reproducing the original manganite or other compound, and at the same time obtaining ydrochloric acid and dilute chlorine; and in various modifications of this process and of the apparatus, arrangements, proportions of materials, and methods of procedure employed.

A.D. 1872, February 1.—No. 318.

ALLIBON, George, and MANBRÉ, Alexandre, of 19, Salisbury Street, Strand, London.—"Improvements in steam boilers or steam generators."

In employing two or more cylindrical vessels, within one of which is the furnace bridge and combustion chamber, and in the other—tubes only. The fuel is consumed or "burned off" in the one vessel, whilst the products of combustion are caused to pass through the other or multitubular vessel, and from thence to the "uptake" and funnel or to the chimney.

These two kinds or descriptions of vessels or steam generators may be combined together in several ways, as there may be one, two, or more of those with furnaces joined to one larger multitubular vessel; or two or more vessels containing internal furnaces may be connected to and with multitubular vessels placed transversely either above or at the ends of and on the same plane, or otherwise as may be most convenient.

In the employment for such purposes of thin metal for the heat-transmitting surfaces applied in the form of continuous hoops or rings of suitable diameter and limited width, having a flanch at each edge; such rings being combined or connected together "flanch to flanch" by riveting or otherwise and the whole tied longitudinally and stayed by gusset-stays. The flanches also form heat conductors and transmitters as well as strengtheners.

In the employment of these metal rings for the outer barrel of a cylindrical boiler or steam generator as before described. The flanches of the rings, which for the furnace flue would project externally, may for the external sheet or barrel be either external or internal.

A.D. 1872, February 1.—No. 319.

BAYLY, Mansel, of 41, King's Road, Brighton, in the county of Sussex.—"A new or improved combined "machine for printing with or without self inking apparatus, perforating, stamping, copying, and "embossing."

Combining, in a small space and with simple construction, the advantages of a self inking printing press with a perforating, stamping, copying, and embossing machine.

The manner in which the platten and inking apparatus work, vitz., by the oscillating of the centre girder, rendering it unnecessary (when useing the machine as a die press) to remove the die for the purpose of inking it.

A.D. 1872, February 1.—No. 320.

DAVIS, William, of Gainford, in the county of Durham, gentleman.—"Improvements in the apparatus "for taking votes at parliamentary and municipal elections."

The principle of this invention is the recording of votes at elections by means of circular plates or counters placed by the voter in slots at the upper end of a box having a separate drawer beneath each slot; confining the action of the voter to the placing of the counters in the slots, where they are made to remain, by a sliding plate underneath, till the elector is out of the voting compartment, when the sliding plate is withdrawn by a person appointed to that duty, and the counters fall into their respective drawers below; indicating the name of each candidate by a number placed opposite to a slot; having these numbers (to guide the uneducated) in units as well as figures; and having each counter of one uniform and understood weight, so that the number of votes given to a candidate may be instantly ascertained by placing the counters in a balance.

A.D. 1872, February 1.—No. 321.

LAKE, William Robert, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Gormly Myers, of the city and state of New York, United States of America.*)—"An improved burner for lamps and other illuminating apparatus."

The said burner consists of two tubes, one of which is attached to the lamp while the other tube is fitted to slide upon it. This sliding tube is closed at its upper end but is perforated with small holes. Just below these holes the said tube has a wide flange. Into the fixed or inner tube I insert an ordinary cotton wick.

A.D. 1872, February 1.—No. 322.

LLOYD, Edwin, of Westgate, Grantham, in the county of Lincoln, ironmonger,—" Improved construction " of sashes and frames for the protection of flowers, fruit and other trees, and plants."

This consists in making the sash or frame proper of a combination of single and double grooved or channelled bars, so arranged that the panes or sheets of glass or other material can be slid into position without the use of putty or other cement. The sashes or frames can be arranged as top or side lights of conservatories, green-houses, hot-houses, and similar buildings, or as separate frames with gutters for attaching to walls or to brackets thereon.

A.D. 1872, February 1.—No. 323.

WAPLINGTON, William, and **BARKER, George Elliot**, both of Sheffield, in the county of York. —" Improvements in the manufacture of spiegleisen."

Our invention relates to improved methods for the production of what is known as spiegeleisen, and consists, firstly, in producing from cast iron which is carbonized and then mixed with alloys of manganese and iron; 2ndly, by melting refined cast iron in a Siemens' air or other suitable furnace in contact with the oxides or other compounds of manganese, together with an excess of carbonaceous fuel; 3rdly, in effecting the carbonnization of cast iron in one furnace and the reduction of the oxides or other compounds of manganese in a separate furnace, and then allowing the results to run or mix together in a suitable converter, mould, or other apparatus.

A.D. 1872, February 1.—No. 324.

ROSBOROUGH, John Lees, of 9, Upper Cross Road, in the city of Dublin, inspector of cleansing and watering city of Dublin.—" Improvements in apparatus or means for transporting mud and sweepings " collected from the surfaces of the streets and thoroughfares."

This invention has for its object the conveying away of mud and sweepings obtained from the surfaces of streets and roads in a more expeditious and economical manner than by the present costly system of carting the same to distant depôts; and consists essentially in the use of sunk covered cisterns situate in various convenient parts of a town, and in communication by special pipes with the street mains, and by other special pipes with the main outfall or depôt outside the town. To these cisterns the collected mud or sweepings is or are carted, but as the cisterns are numerous and situate in the most convenient districts selected for the purpose, the cartage is only over short distances in lieu of over long distances to the suburban depôts.

The mud or sweepings collected in the said district depôts or cisterns is there mixed with a sufficient amount of water obtained from the street mains to render it capable of being run off through the discharge pipe by gravitation along with the water whilst held in suspension therein. In some cases the water used may be forced under pressure along the said discharging pipes from the cisterns; such pressure being obtained by connecting the closed cisterns with the ordinary high pressure street mains or by pumping or other well known hydraulic machinery; or the cisterns may be considerably elevated and provided with cart approaches to afford access thereto, so that the liquifie mud or sweepings in such elevated cisterns will be forced by head pressure along the pipes to the general outlying depôt.

A.D. 1872, February 1.—No. 325.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.— (*A communication from Charles Motier Nes, of York, Pennsylvania, United States of America.*)—" Improve- " ments in the manufacture of iron and steel."

This invention involves the employment in the production of iron and steel of a magnetic silicide of iron ore, sometimes known as Codorus ore, which is found in Heidelberg township, York county, Pennsylvania, and in other localities.

A.D. 1872, February 1.—No. 326.

FLETCHER, George, the younger, of Derby, in the county of Derby, engineer.—(*Partly a communication from George Brocklehurst, of Barbadoes.*)—"Improvements in the evaporation and granulation of sugar, and "in the apparatus or machinery connected therewith."

In carrying out these improvements the bottom or bottom and sides of the pan is or are jacketted, and the steam drum placed therein is welded instead of being rivetted up with angle iron, and is fixed in its place by means of a screw nut on the end of its spindle. The condensed water is made to pass from the drum by its own specific gravity and thence through the jacket of the pan to the condensed water box. For boiling or concentrating at a lower temperature and to obtain a larger grain and assist evaporation, a lower or less pressure of steam is employed.

The liquor or syrup is agitated during ebullition or not by a suitable arrangement.

Two or more of the improved pans being provided with gutters round the rims, may be used to supersede the ordinary teach, and boil solely by steam.

The pan may be used either as a vacuum pan or as a still by covering it with the usual vacuum pan or still head.

The inner surface of the pans and outside of the drum may be coated with copper, nickel, tin, or other metal capable of resisting acids.

A.D. 1872, February 1.—No. 327.

CURTIS, William Joseph, of Holloway, in the county of Middlesex, civil engineer.—"Improved means "of and apparatus for obtaining extracts or infusions from vegetable or other substances, and filtering or "clarifying liquids."

The object of my invention is to facilitate the obtaining of extracts from or infusions of various substances, and is effected by causing a circulation of the water to be maintained through the mass until all the useful properties are extracted from the substance under operation.

A.D. 1872, February 1.—No. 328.

CARTER, George Hayes, of Mottingham Lodge, near Eltham, in the county of Kent.—"Improved "mechanical arrangements for converting reciprocating motion into rotatory motion."

The features of novelty of this invention consist in causing pressure of a shoe piece or a toothed wheel against a disc or wheel fixed on the main shaft or spindle of an engine or other rotating machine and in connecting the said shoe piece or wheel to a crank arm, the lower end whereof is loose on the shaft and the upper end carries the aforesaid shoe piece. Two arms shoe pieces and one or two discs are employed and actuated either by a crosshead on the piston rod of an engine or by cords or bands fixed to treddles for machines intended to be worked by foot.

The aforesaid crank arms are so arranged as to get rid of the null point of an ordinary crank by moving in an alternate circular direction instead of in a continuous circular direction.

A.D. 1872, February 1.—No. 329.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from David Addison Clarke, of Baltimore, Maryland, United States of America, brewer.*)—"An improved method of preparing and preserving hops for the manufacture of beer, and for "medicinal purposes."

The said invention consists in using ground or pulverized hops in the process of making beer, and in packing the hops, so reduced to powder, in air-tight packages, bottles, or vessels as a new article of manufacture and trade both for brewing and medicinal purposes.

A.D. 1872, February 2.—No. 330.

GILYARD, Edmund, of Bradford, in the county of York, locksmith.—"Improvements in furniture for "locks."

This invention relates to the employment of a loose collar having a rim cast round it to fit the neck of the knob, and also a boss cast in the centre, in which a female screw is cut receiving the knob spindle screw threaded at both ends; a box is fixed in the back part of the knob. A washer of leather, india rubber, or gutta percha is placed between the collar and neck of the knob.

This invention relates also to the employment of a rose socket made of thin round metal having a hollow boss cast in the centre; this socket is screwed on the door before the rose of china, glass, wood, or metal is put on.

A.D. 1872, February 2.—No. 331.

WALKER, William, of Liverpool, in the county of Lancaster, consulting engineer.—"Improvements in "and machinery for the manufacture of 'hard-topped' and 'soft-laid' twine, 'mill-banding,' strands for "ropes, and other purposes, and cordage generally from hemp, flax, and other like fibrous material."

Consists in arranging the yarn or strand bobbin around a centre and driving them by preference from a friction wheel common to all keyed on to a hollow shaft, the top of which carries the forming tube fitted with a pair of grooved draw-rollers having their axle at right angles to the shaft, and one of which carries a bevelled wheel which travels in a circular stationery race, which encompasses the hollow shaft. The lower end of the shaft is fitted with a bevelled wheel which gears into or impinges on a bevelled wheel on a horizontal first motion shaft. Immediately in line with this hollow shaft is a second hollow shaft which forms the neck of the take up reel flyer, and to which is keyed or bevelled [*a bevelled**] wheel actuated by a second bevelled wheel on the first motion shaft. There is a peculiar screwed motion arrangement connected with the take up flyer for laying the finished cordage on to the reel, a provision being made for driving the screw gear from below, also for applying the required friction to the take up reel, the whole apparatus being mounted in a suitable frame.

A.D. 1872, February 2.—No. 332.

FRANKLIN, Francis Mark, of No. 18, Noble Street, in the city of London, gentleman.—(*A communication from Peter Payne and Samuel Maurice, both of 33, Rue Vivienne, Paris, France.*)—"Improvements in "capsules."

This invention refers to a very simple mode of hermetically sealing bottles, jars, can, or boxes by means of a peculiarly formed capsule. In the centre of the capsule is an opening protected or covered by a shield or slide working on a pivot or screw. Beside the capsule and next the pivot or slide is a cork washer secured in its place by another thin metal washer. When the capsule is secured to the bottle, jar, can, or box, the cork washer becomes pressed on to the shield or slide; and, until it is desired to open the bottle, jar, can, or box by withdrawing the shield or slide, it remains hermetically sealed.

A.D. 1872, February 2.—No. 333.

SCHÜSSLER, Carl Ferdinand, and **WAGNER, Carl Wilhelm Frederick**, of Hamburg, engineers, residing at Bohn's Hotel, 6, Circus, Minories, London, and 24, Kielerstrasse, Hamburg.—"Improved motive "power engines."

1. The novel construction of the wheel (or wheels) with bearings or sockets all around the periphery.

2. The form of the weighted levers and mode of attaching them to, and working them on, the wheel (or wheels).

3. The moveable framework carrying the peculiarly curved guide-rail or rails.

4. The methods of starting, stopping, regulating the speed, and also reversing the action of the machine or engine.

5. The general arrangement and combination of parts.

A.D. 1872, February 2.—No. 334.

HARRISON, William Samuel, of Gloucester Road, Peckham, in the county of Surrey, horologist, and **ROTTER, Charles Gottlieb**, of Choumert Road, Rye Lane, Peckham, in the county of Surrey, gentleman.—"Improvements in the mode of taking the poll of voters and for enumerating and registering "votes, and in the method of and apparatus for recording and indicating the poll."

The object of this invention is to enable elections under the ballot system to be conducted in secrecy, the voter at the time of voting being out of all control and observation; and to provide mechanism which will accurately enumerate and register the number of votes given by the voter, without leaving the means by which the names of his selected candidates may afterwards be ascertained. The enumerating and recording are effected by mechanical means and can be adapted to variations in the numbers of candidates and representatives. The recording [*apparatus*†] is kept under the seals of the candidates until verified by them or others appointed for the purpose. Unqualified voters can be detected. The state of the poll may be taken at any time or may be kept secret until the close. Electors who cannot read may vote by color.

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* The words "a bevelled" are found in the copy of the Abridgment delivered by the Applicant, but do not appear in the original Abridgment.

† The word "apparatus" is found in the copy of the Abridgment delivered by the Applicants, but does not appear in the original Abridgment.

A.D. 1872, February 2.—No. 335.

VERNON, Horace A., corporal, Royal Artillery, of Tilbury Fort, in the county of Essex.—"An improved "trail of field guns, dispensing with limbering and unlimbering."

Adjusting springs under the gun carriage, which neutralise the recoil of the gun, and a mechanical arrangement for adjusting the trail of the gun, whereby the necessity for limbering and unlimbering is avoided.

A.D. 1872, February 2.—No. 336.

JOWETT, Grace, of Bradford, in the county of York, midwife.—"A new or improved apparatus for "beating eggs."

This invention has for its object the construction of a simple and economical apparatus to be employed for beating or mixing eggs required for culinary or other purposes.

I employ a cylindrical vessel, the bottom of which is formed as a cone projecting upwards within the vessel a suitable distance, the eggs to be beaten or mixed are placed within the vessel, a rod or plunger, on the lower end of which is a hollow cone perforated and of corresponding size to that formed by the bottom of the vessel. On the rod or plunger being worked within the vessel after the manner of a piston the component parts of the eggs are forced through the perforations on the plunger, and so thoroughly beaten or mixed.

The vessel may have a flat or plain bottom, and the plunger consist of a perforated disc, but I prefer the conical form above described.

A.D. 1872, February 2.—No. 337.

CROSS, George James, of New Cross, in the county of Kent, engineer and founder.—A new or improved "manufacture of iron for tramway wheels or tyres."

Making tramway wheels or tyres of a mixture of certain brands of English or Scotch hard white pig metal iron and soft pig iron; proportions for one wheel 168 pounds of hard to 112 pounds of soft. These are smelted together and run into an ordinary chill box.

A.D. 1872, February 2.—No. 338.

JARMAN, Henry, of Russell Street, Brighton, and **MITCHELL, George**, Saint Martin's Place, Brighton, both in the county of Sussex, bakers.—"Improvements in furnaces, in the heating of ovens and boilers, "purifying heat, economising fuel, and consuming smoke."

Heretofore in the heating of ovens for baking purposes by furnaces it is customary to introduce the fire vapour of the combustive material by a side orifice into and through the oven or chamber near unto the entrance thereof with a corresponding aperture on the opposite side, by which means the whole of the smoke and vitiated air passes from the oven or chamber into the chimney or shaft leaving its sooty deposit, impurities, and non-uniformity of heat behind. Now our invention consists in constructing an atmospheric chamber in the furnace, by which means we condense the smoke and impurities precipitating it on the combustive fuel and thus destroying the impurities therein contained, creating thereby a purer atmosphere, a saving of fuel, a clear blast of heat which in its course of transit towards the oven or chamber is purified and then injected into the oven or chamber by means of a fan jet distributing the heat uniformly, thus economising space and improving the baking, cooking, and boiling process.

A.D. 1872, February 2.—No. 339.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—*(A communication from John Lawrence, of Philadelphia, Pennsylvania, United States of America.)*—"Improvements in nail machines."

This invention relates to the feed mechanism of what are known as cut nail machines, and also to mechanism for holding the cut blank and conveying it to a suitable position to be operated upon by the heading dies and finally ejecting the finished nail.

A.D. 1872, February 2.—No. 340.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—*(A communication from Joseph Kay Caldwell, of Philadelphia, Pennsylvania, United States of America.)*—"Improvements in burning hydrocarbons, and in apparatus to be employed therefor."

This invention relates to a mode of and apparatus for burning liquid hydrocarbons for heating purposes, and consists in producing a combustible vapour or spray by causing a forcible jet of dry or superheated steam to cross the exposed orifice of a tube or passage communicating with a supply of petroleum or other liquid hydrocarbon.

A.D. 1872, February 2.—No. 341.

GRAFTON, SIDNEY, of Birmingham, in the county of Warwick.—"Improvements in pocket match-" holders."

The wax vestas are contained in the one end of a tube or box and are fed one by one as required through a central tube leading to the other end, being retained by the head in a clip on said tube. The bottom end of the falling match is also clipped by making the match case compressible, and on pulling the two parts of the box apart the match becomes ignited and at same time screened from draught by being enclosed in the case. A hole may be provided in said case at which to light a cigar or pipe when the match is ignited.

A.D. 1872, February 2.—No. 342.

THORPE, JOHN, of Stratford on Avon, in the county of Warwick, nurseryman.—"An improvement or " improvements in the manufacture of garden tallies or plant labels or markers."

This invention consists in making articles of the above description of an amalgam of lead, tin, and zinc, and by preference in the proportion of ninety parts zinc, five parts lead, and five parts tin run in moulds with the titles cast upon the tablets at the same operation. Such tallies, labels or markers are practically indestructible by the action of the soil or the atmosphere.

A.D. 1872, February 2.—No. 343.

JONES, EDWARD, of Birmingham, in the county of Warwick, machinist.—"Improvements in the manu-" facture of cartridge cases, and in the apparatus to be used in the said manufacture."

This invention relates to the manufacture of solid cartridge cases, and also to compound cartridge cases or those cases which are provided with an attached metal base, the chief object being to effect an economy in their manufacture.

A.D. 1872, February 2.—No. 344.

NEWTON, ALFRED VINCENT, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from William Webster, of Morrisania, and Cornelius Morgan Miserole, of New York city, both in the state of New York, United States of America.*)—"Improvements in " the mode of and apparatus for manufacturing terry and cut-pile carpets and other terry fabrics."

This invention relates to the manufacture of terry and cut pile fabrics and imitations of terry fabrics, to be used for carpeting, rugs, mats, and like purposes, with two faces, either of which may be presented upward or outward.

A.D. 1872, February 2.—No. 345.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Benjamin B. Hotchkiss, of the city and state of New York, United States of America, civil engineer.*)—"An improved wood-pavement."

I use a foundation consisting of two layers of planks or boards so placed one upon the other that they break joint. Upon this flooring I place the wood blocks in rows or lines with spaces between the rows, and at the bottom of the spaces I place a flexible rod or strip of wood, or two or more of such strips. Above these strips the spaces are filled with gravel or other substances rammed or packed tightly.

A.D. 1872, February 2.—No. 346.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Benjamin B. Hotchkiss, of the city and state of New York, United States* *of America, civil engineer.)*—" An improved machine for packing and securing blocks laid for paving and " for other like purposes."

This invention relates to a machine for tightly driving and packing cement, gravel stones, and other substances between the blocks of a pavement or of foundations for buildings and other similar constructions. On a frame supported on wheels I mount a hammer. In combination with the said hammer I arrange an excentric or cam for raising the same; at the rear of the said machine there is a lever whereby the machine is moved and the hammer is controlled. A bar of the proper thickness to enter and fit the spaces to be packed is placed under the hammer in such a position that the said hammer when dropped will strike the upper edge of the said plate. In using my improved machine the aforesaid bar is placed upon the packing, and the hammer is put in operation, and the machine is moved forward, till the packing of the whole pavement is finished.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 27 to August 2, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, February 3.—No. 347.

PUNSHON, Robert, of the town and county of Newcastle upon Tyne, gentleman.—" Improvements in " apparatus for measuring and registering liquids."

A float or weight is caused by its descent, as the level of the liquid in a cask or vessel becomes lowered y its being drawn off, to act by means of a cord on a drum carrying an indicator, which is thus made to egister by pointing to the divisions on a stationary disc or dial.

The indications may be multiplied as required by the addition of counting wheels as usual.

The stationary disc or dial and the revolving drum are supported by a tube passed through the bung of the cask, through which tube also passes the cord from the drum to the float or weight.

A.D. 1872, February 3.—No. 349.

CLARKE, James Langton, of The Common, Ealing, in the county of Middlesex, clerk.—" An improved " method of and apparatus for preventing candles from guttering."

The use of a tube tapering towards both ends, the upper end expanded into a saucer, the tube being made of glass, with the lower end wide enough to slip over the candle, and the upper end slightly narrower han the diameter of the candle, so that the candle comes nearly up to the top of the tube, and the use of metal band round the outside of the tube immediately below where it expands into the saucer form to qualize the heat round the top of the glass tube by the conducting power of the metal.

A.D. 1872, February 3.—No. 353.

LUNDELL, Walter, of 75, Mark Lane, in the city of London, gentleman.—" An improved compound cape, applicable also for use as a bed and for other purposes."

This invention consists in a novel combination and arrangement of parts whereby an improved compound aterproof cape is produced which when not worn as a cape may be used as a bed or in parts serving as a ilway travelling rug or otherwise and portions of this compound cape are applicable also for carrying ater or other liquid when travelling and for other purposes.

A.D. 1872, Febuary 3.—No. 356.

ENNISON, Aaron Lufkin, of Handsworth, in the county of Stafford, watch manufacturer.—" Improvements in watches and pocket chronometers."

According to this invention the bezel holding the glass and the back of the case are secured to the case screwing them thereto instead of hinging them thereto as usual, the case is thereby made air and water ght. For the same purpose the winding arbor and the push piece for setting the hands work through ckings. Instead of the ordinary winding gearing, gearing wheels are employed made of two parts one rt being composed of bevilled and the other of straight teeth. In the mechanism for setting the hands e intermediate gearing is dispensed with, and the minute wheel has teeth one half straight for engaging ith the cannon pinion, and the other half bevilled to be operated upon by the clutch gear for setting the nds. In place of the ratchet wheel in the winding mechanism the ordinary gear is employed, a click ving two or more teeth engaging with the teeth of the said gear. The winding mechanism is arranged nder a solid block secured to the bottom or pillar plate. The minute wheel works in a recess in the plate, bridge being fixed over the said minute wheel.

A.D. 1872, February 3.—No. 357.

NORTON, James Lee, of Belle Sauvage Yard, Ludgate Hill, in the city of London.—" Improvements " in stables, sheds for cattle, and slaughterhouses, and in paving or flooring for the same, and other " surfaces."

This Provisional Specification describes forming the central part of the floor of a stable horizontal and of openwork paving or grating, whilst the two side portions slope downwards towards the central strip of paving, below which are inclines leading to a pit or to a gutter. The openwork paving or grating of the central strip is supported on wooden bearers forming part of a wooden frame, which is dropped into a recess formed to receive it. Frames covered with matting are in some cases hinged to the sides of the stall.

Paving suitable for the central strip and pavings suitable for the side strip are also described, and these may be used for paving other surfaces.

A.D. 1872, February 3.—No. 358.

BURGESS, Edward, of Mountroy, in the city of Wells, in the county of Somerset.—" Improvements in " apparatus for evaporating and incinerating alkaline lyes or solutions ordinarily used in the manufacture of " paper, and in the treatment of such solutions when spent for the purpose of recovering therefrom valuable " chemical products."

This Provisional Specification describes apparatus for evaporating and incinerating alkaline lyes which have been used for treating esparto grass, straw, or other vegetable fibre, in the manufacture of paper, and to a method of treating such solutions to recover the alkali.

The spent lyes are evaporated in a a pan within which are heating pipes supplied with steam from a steam boiler under pressure. The greater part of the water is evaporated from the lyes in this pan, leaving a thickened residue which is run down to the beds of furnaces below the boiler and subjected to the incinerating process. There are two furnaces, one at each end of the boiler, and they work independently of each other. One of the furnaces is kept in a state of active combustion while the other is being raked out, re-fed, and re-fired.

A.D. 1872, February 5.—No. 359.

WELDON, Walter, of 29, The Cedars, Putney, in the county of Surrey.—" Improvements in obtaining " and decomposing sulphate of sodium and sulphate of potassium, and in obtaining hydrochloric acid and " chlorine."

Sulphate of sodium or sulphate of potassium and hydrochloric acid are produced under this invention by treating a mixture of chloride of sodium or chloride of potassium and sulphide of manganese with air and steam at a suitably high temperature, or by treating a mixture of chloride of sodium or chloride of potassium and oxide of manganese with sulphurous acid gas and air and steam, or by treating a mixture of chloride of sodium or chloride of potassium and either oxide of manganese or oxide of iron with steam and sulphuric anhydride. The sulphate in mixtures of sulphate of sodium or sulphate of potassium and oxide of manganese or oxide of iron, produced as above or otherwise, is decomposed by treatment with a suitable reducing flame or with carbonic oxide at a high temperature, and the soluble product of such decomposition is then dissolved out and suitably utilized, and the insoluble residual sulphide of manganese or of iron employed to produce more sulphate of sodium or sulphate of potassium.

A.D. 1872, January 5.—No. 376.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Edouard Beckman Olofson, a person resident at Strasbourg, Alsace-Lorraine, Swedish gentleman.*)—" New and " improved alimentary drink."

This invention consists to make a new and improved wholesome, alimentary, and economical drink by using rye or preferably rye malt and dried barley malt torrified, pounded, and mixed together and combined with the aroma of natural coffee and a little burnt sugar.

A.D. 1872, February 5.—No. 378.

HOLLAND, Henry, of Birmingham, in the county of Warwick, tool maker.—" Improvements in clippers " for clipping or shearing horses and other animals."

According to this invention the moveable cutters of the clippers are made automatic or partly automatic. Two toothed cutting plates one fixed and the other moveable or a rotating cutting roller having a helical cutting edge and a fixed cutting plate are employed. A reciprocating motion is given to the moveable cutting plate by means of two pinions each having two teeth only gearing alternately with a rack on the moveable cutting plate, one pinion coming into gear when the other pinion is gone out of gear. The shafts carrying these pinions are geared together by other pinions and are made to rotate in opposite directions. Rotatory motion is transmitted to the shafts through a train of wheels driven by a spring barrel.

When a rotating cutting roller and a fixed cutting plate are employed a rotatory motion is given to the cutting roller by a pinion on its end which is driven by a train of wheels and spring barrel.

When the moveable cutting plate is worked by hand a reciprocating motion is given to it by a pair of levers or handles. One handle is fixed to the stationary cutting plate or covering cap and the other and moveable handle has at its top a tooth or stud which takes into a rack or cup fixed on the moveable cutting plate. A spring between the handles tends to separate them. By closing the handles by the hand the moveable plate is moved in one direction, and by relaxing the pressure the spring separates the handles and gives the return motion to the moveable plate.

A.D. 1872, February 6.—No. 380.

MENDEL, Sam, of Manchester, in the county of Lancaster, merchant.—"An improved mode of, and "apparatus for applying colour to blocks for stamping trade marks on woven fabrics."

My invention consists in so constructing the colour troughs and supplying the colours to them that trade marks of two or more colours can be stamped at one operation, thereby producing trade marks that are more ornamental and more easily recognized than those produced of one colour in the ordinary manner.

A.D. 1872, February 6.—No. 386.

TITLEY, Robert, of Birmingham, in the county of Warwick, brassfounder.—"Improvements in louvres "and louvre blinds, and in fittings or mechanism for actuating, adjusting, and fixing louvres and louvre "blinds for various purposes."

According to this invention the louvres are made to turn upon axes situated near their inner edges, so that when the louvres are opened they do not project inside the carriage, the projecting parts of the louvres being external. The louvres are jointed to the inner face of a flat rod crossing the middle of the louvre blind. The raising and lowering of this rod closes and opens the louvres. The bottom of the rod slides in a guide on the lower edge of the blind frame, a spring in the guide pressing upon the rod and producing sufficient friction to maintain the rod and louvres in any position to which they may have been brought. The closing of the louvres is ensured before the blind frame is let down into the lower half of the carriage door, by means of a slide connected with a lever jointed to the top of the actuating rod of the louvres. The upper part of the slide crosses the top edge of the frame, and when the louvres are opened stands a short distance above the said top edge. On lifting the louvre frame to its full extent, preparatory to its depression into the lower half of the carriage door, the cross piece of the slide strikes against the upper edge of the door frame, and being pressed down thereby acts upon the actuating rod described, and closes the louvres.

A.D. 1872, February 7.—No. 397.

HARRIS, Joseph, of Birmingham, in the county of Warwick, smith, and **NORMINGTON, Daniel**, of Birmingham, aforesaid, fitter.—"Improvements in the joints of metallic bedsteads, sofas, couches, and "other articles of like manufacture."

According to this invention a block is cast on the ends of the angle bars consisting of two branches, one horizontal and the other vertical, the said branches projecting a short distance beyond the inner and outer faces of the bars. The front and back faces of the block are slightly inclined. These blocks are dropped into recesses of a corresponding shape formed in the corner block. These joints are very strong and steady, the vertical branch of the block on the angle bar giving steadiness and rigidity in a vertical plane, and the horizontal branch of the block giving steadiness and rigidity in a horizontal plane.

A.D. 1872, February 7.—No. 398.

MORRALL, Edward, of Astwood Bank, near Redditch, in the county of Worcester, machinist.—"Improvements in machinery employed in the manufacture of sewing machine needles."

This invention consists of improvements in reducing machines by which the blade and shoulder parts of sewing machine needles are reduced or shaped by a turning process from lengths or pieces of wire having the diameter of the stems of the needles to be made.

The cutter is supported in a slide rest which has a traversing motion given to it to carry the said cutter against the rotating length of wire fixed in the spindle of the machine. These improvements consist principally of an adjustment wheel on the end of the adjusting screw of the cutter for giving a very fine adjustment to the said cutter for the formation of the blade part of the needle wire, and also of a defending arm on the said screw acted upon by a fixed upright of the machine for withdrawing the cutter at the proper time for the formation of the shoulder part of the needle wire. The adjustment wheel is divided on its periphery, and is prevented from rotating by a tooth or pawl engaging in one of the divisions of the said wheel, the said wheel is however capable of sliding on its locking pall or tooth. The motion of the depending arm is limited by an adjusting stop, a jointed catch fixing the said arm and preventing the advance of the cutter, while the slide rest makes its return motion after the needle wire has been shaped.

By these improvements great uniformity in the size and shape of the blade and shoulder parts of the shaped or reduced wires are secured, little waste is made, and the adjustment of the cutter is effected with great accuracy.

A.D. 1872, February 7.—No. 406.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Albert Hamilton Emery, of the city and state of New York, United States of America.*)—" Improvements in weighing machines."

This invention of improvements in weighing machines relates, first, to machines whereby the horizontal movement in the platform of weighing machines may be prevented.

Secondly, to the method of receiving the pressure from the load to be weighed and transmitting a fractional portion thereof to the scale beam; and thirdly, to the construction and arrangement of the levers and their connections, composing the scale beam, also to the construction of the weights employed, and the method of connecting them to the scale beam.

A.D. 1872, February 26.—No. 602.

WELDON, Walter, of 29, The Cedars, Putney, in the county of Surrey.—" Improvements in treating " and applying dilute chlorine."

Converting dilute chlorine into strong chlorine by treating four equivalents of dilute chlorine by two of milk of lime, so as to produce two equivalents of chloride of calcium and two of free hypochlorous acid, and then treating that product with hydrochloric acid; or by similarly treating the dilute chlorine by certain other oxides, or by certain salts, and treating the product by either hydrochloric acid or a metallic chloride.

A.D. 1872, February 28.—No. 619.

TOFT, Charles, of Gravelly Hill, in the county of Warwick, modeller.—" An improved balance cover for " hot water jugs and other covered vessels of a similar description."

The object of this invention is to provide a self acting balance cover for the vessels referred to in the title, of a simple and inexpensive description, and this I achieve by forming a cover of a size and kind adapted to the top of the vessel to which it is to be applied, and causing the same to be evenly balanced over the said top or aperture by being suspended in opposite sides of the vessel by means of a pin running across the centre of the lid and cemented thereto, the two ends or extremities of the said pin constituting together the axis upon which the lid works.

It will be understood that a suitable recess is formed in each side of the vessel for the extremities of the said pin to take in; and by preference these recesses or bearings are made in a slightly oblique direction towards the lip part of the jug, so that when liquid is poured from the jug the cover may not fall off.

A.D. 1872, May 3.—No. 1354.

IMRAY, John, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—" Improvements in interlocking apparatus of railway points and signals."

This invention relates to a mode of and apparatus for interlocking the levers employed to work railway points and signals. The levers fitted with spring catches of ordinary construction are arranged in a row, and each lever works within a slot in a rocking shaft. This slot has side notches at each end, in which notches the lever is held at either end of its stroke. The rocking shaft is worked by the action of the spring catch of the lever, so that the lever is released from a notch when the spring catch is closed by hand before moving the lever, and is engaged in a notch when the spring catch is let go after moving the lever fully over. Some of the rocking shafts work longitudinally, sliding bars, on which are fixed stops, and others of the rocking shafts have lips which either obstruct or are obstructed by some of these stops, the stops being arranged so as to effect the required interlocking.

A.D. 1872, July 29.—No. 2263.

BOUSFIELD, George Tomlinson, of Sutton, in the county of Surrey.—(*A communication from Joel Wilson, a person resident at Dover, state of New Jersey, in the United States of America.*)—" Improvements " in furnaces for deoxydizing iron ores preparatory to their being worked into wrought iron."

This invention relates to furnaces adapted to accomplish the deoxydizing of iron ores by cementation preparatory to their being worked into wrought iron, and it consists of certain combinations and arrangements of retorts and flues, which are herein-after more fully set forth, by which the said operation is more satisfactorily and economically accomplished than has heretofore been done.

The said combination and arrangements are the following, viz.:—

1st. The arrangement and combination of a circular series of uprights, retorts, and intervening flues, an internal chamber within said series for the products of combustion, and a collecting chamber for receiving said products after they have traversed the intervening flues.

2nd. The arrangement and combination of the said internal chamber, the circular series of upright retorts surrounding that chamber, and a flue for delivering the products of combustion from the balling furnace.

3rd. The arrangement and combination of the internal chamber, the circular series of upright retorts surrounding that chamber, the flues intervening between the said retorts, and an external annular flue space surrounding said retorts.

4th. The arrangement and combination of the internal chamber, the circular series of upright retorts surrounding said chamber, the flues intervening between said retorts, the annular flue space surrounding said retorts and partitions at the upper ends of said flues for deflecting the products of combustion.

A.D. 1872, July 30.—No. 2268.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Charles Houghton, of Boston, Massachusetts, United States of America.*)—" Improvements in apparatus for raising " water."

The claim to this Complete Specification is—

The general construction and arrangement of the apparatus for raising water and the specific construction and arrangement of the pipes, valves, generator, and other parts, substantially as shewn and described.

A.D. 1872, July 30.—No. 2269.

FLOOD, Henry Stephen, of San Francisco, county of San Francisco, state of California, in the United States of America.—" An improved corset."

The object of this invention is to provide a corset for female wear which can be partially opened and turned down in front without the necessity of unfastening the entire corset. This is accomplished by the employment of a hinge or other joint at the desired point on the front steels, so that by unhooking or otherwise unfastening the upper portion it can be turned down and thus expose the breast.

A.D. 1872, July 30.—No. 2283.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 35, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from Erastus S. Bennett, of the city of Brooklyn, in the county of Kings, and state of New York, United States of America, Doctor of Medicine.*)—" Certain " improvements in rotary engines and pumps."

The invention consists, first, of an elliptical casing containing a central shaft and a cylindrical hub in which are a number of radial pistons which in their revolution are kept constantly in contact with the interior of the casing by the action of the stationary cams on which the sliding pistons ride.

Second, of a novel combination of valve and ports with the casing, rotary hub, and pistons, said valve and ports affording a simple and convenient means of stopping, starting, and reversing the engine.

Third, of supplementary ports or ducts by means of which the fluid may be made to act simultaneously on two pistons on opposite sides of the rotary hub.

Fourth, of recesses provided on the interior of the cylinder or casing permitting the fluid to pass freely around the sliding pistons just before they come into action and after they go out of action, by which means obstruction of the ports and passages is avoided and the pressure is balanced on their opposite sides when they are not in operation.

Fifth, of a mode of applying rollers to the sliding pistons to reduce friction.

Sixth, of a mode of applying shoes and springs to the said sliding pistons to cause them to slide with greater freedom.

Seventh, of a soft metal packing or bushing applied to the guides or grooves in which the pistons slide.

Eighth, of a combination of sliding pistons, shoes, springs, and stationary cams in a rotary engine.

And, ninth, of appliances for lubricating the moving parts.

A.D. 1872, July 31.—No. 2288.

LAYCOCK, Thomas, of Skipton in Craven, in the county of York, manufacturer.—" Improvements in the " construction of sewing machines."

These improvements are for preventing the breakage of needles, insuring a better loop and less liability of mis-stitches. The course of the needle is entirely free from the shuttle race, except when the loop is formed for the point of the shuttle to enter. An apparatus or presser attached to the machine bends the needle towards the shuttle and forms a better loop, when the presser is withdrawn, and the needle returns to its position.

A.D. 1872, July 31.—No. 2295.

HUDSON, William Smith, of Paterson, Passaic county, New Jersey, in the United States of America.—" Improvements in locomotive engines."

The improvements relate more especially to locomotives adapted for hauling heavy trains at moderate speed, but some features thereof may be used with much advantage on lighter and quicker running machines. The improvements are adapted for either narrow or wide gauge The first part of the invention relates to oblique equalizing levers, which support a part of the weight of the locomotive, and also to a peculiarity of the construction of a part at the centre of a truck or half truck, and the arrangement of the draw-bar to pass through the same. I extend the draw-bar through an opening in the centre block of the truck. The novelty in the truck lies in receiving the equalizing levers in oblique positions, very near the centre, and within what may be called the centre pin. The centre is formed with an open casting, which is guided within a stout rigid framing fixed to and forming a part of the main framing. The sides are plane, and the entire casting casting is rectangular in its horizontal section, and open so that the draw-bar may move freely through it.

The oblique equalizing levers twin on centres constructed and firmly supported under the main framing. The top of the casting being closed so that the metal is extended across over this opening, causes the casting and its attachments, and thus the whole truck to be loosely locked to the locomotive by the aid of the draw-bar. In case of derailment or other accident the truck is permanently hung to the casting or open block by the union of the swing beam thereto, through the central bolt. At the front end of the locomotive is an ordinary cross lever which I term a cross equalizer, and a fore and aft single lever. The operation of the parts at the forward end of the locomotive is closely similar to that of any other centre bearing half Bissell truck with a central equalizing lever, but the peculiarity due to the openwork of the casting with its closed top and the passage of the draw-bar through it at either end of the structure is realized when the locomotive is thrown from the rails. There is a truck at the rear which is adapted to both swivel and move from side to side. The fire-box of the locomotive is overhung behind the rear drivers and is thus supported between the drivers and the rear truck. There is a truck or half-truck composed of one pair of wheels only in the front of the locomotive. There are equalizing levers distributing the shocks between the driving wheels and the truck at the front and the equalizing levers on one side are peculiarly connected with the corresponding equalizing levers on the other side of the locomotive by the cross beam or partial cross equalizer. The rear truck is free to move laterally and to be guided by the rails. By extending the draw-bar past the centre of the truck, and attaching it nearer the centre of the locomotive, its length is so increased that its obliquity is materially lessened. The rigid frame is extended rearward to support or form a part of the tender, it is also extended forward to support a tank. There is a truck under the tender or extension at the rear, and another under the extension at the front, each of which is adapted to both swivel and move from side to side. The fire-box of the locomotive is overhung behind the rear of the drivers. There are three pairs of driving wheels, the forward and rear pairs are flanged and form the guiding wheel base. Breaks operated from the foot board are introduced between the rear drivers and the middle drivers. The forward driving wheels are without flanges, the middle and rear pair are flanged and control the position of the structure on curves. The longitudinal frames are connected across at the front by stout cross pieces. The rear have a pair of unusually massive half elliptic springs mounted in an inverted position, and so arranged that the bearing of the rear drivers press up under their forward ends. I employ a system of levers forming what has been often used in other combinations and called a "parallel motion." It works with the advantage of very slight friction, and gives a very great degree of strength with small amount of material.

A.D. 1872, August 1.—No. 2304.

BOYDEN, WILLIAM ARTHUR, of Harrisburg, in the county of Dauphin, in the state of Pennsylvania, United States of America.—"An improvement in axle boxes for rail-way cars."

The first part of the invention relates to the combination of metallic plates, which have semicircular edges, with a car axle, and with a recess which surrounds it in the rear end of the journal box, in such a manner as to clasp the axle, to prevent the passage of dust into the box, and also prevent the splashing of oil from the same. For the more perfect accomplishment of the object a washer of leather or other soft elastic material is placed in the recess against the rear side of the outer plate. A perfect binding of the washer upon the axle prevents the dust passing into the journal box, and also arrests the outward passage of any oil which may happen to pass the bearing surfaces of the plates.

The said plates are half lapped with each other outside of their semicircular bearings to secure that part of the joint against the passage of dust or oil. Their semicircular bearings are caused to press gently upon the periphery of the axle by means of wire springs placed in suitable recesses of the car box at radii with the axle.

The second part of the invention relates to the construction of the underside of the top plate of the journal box with a longitudinal swell, against which the upper side of the bearing presses, and upon which it partially rocks, so that the wearing surface of the bearing may automatically change its position and bed fairly upon the journal in all the variations of the latter from its normal horizontal position.

The third part of the invention relates to a dovetail connection of the cover of the front end of the journal box with the latter, so as to dispense with screws or other device for holding the cover.

A.D. 1872, August 2.—No. 2311.

WHITTEMORE, DAVID, of Boston, of the state of Massachusetts, of the United States of America.—(*Partly a communication from William Rhodolphus Landfear, a person resident at Jersey City, state of New Jersey, of the United States aforesaid.*)—"Improvements in machinery for pegging boots and shoes."

This Complete Specification describes my invention, the object of which is to produce a simple, strong, durable, and reliable machine for pegging boots and shoes, and by which the manipulation required of the operator may be performed with greater ease [*and effectiveness**] than by the arrangements heretofore employed.

The nature of the said invention consists as follows :—

In the combination and arrangement of the feed mechanism or sleeve with the peg driver and awl. Mechanism for operating the feed sleeve. Mechanism or means for effecting a direct and convenient movement of the peg wood or severed peg to the driver. Mechanism or means for shifting the line of pegging without stopping the machine. Means of preventing any back movement of the pegwood while being cut by the knife. Mechanism for holding the pegwood in its passage to the driver. The application of an adjustable brake to control the movement of the shoe feeding sleeve, or prevent any back action thereof. Mechanism for compressing the pegwood. The arrangement of the knife with respect to the pegwood passage and the driver, whereby by a lateral thrust of the knife a single peg is cut from the strip and driven before another is severed. In making the sides or mouth of the pegwood carrier adjustable in order to compensate for any wear thereof. In a new device for guiding the awl and driver. In an improved stop motion for arresting the action of the machine. In an improved jack for supporting the boot or shoe and enabling it to be turned and maintained in any desirable position while being pegged.

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* The words "and effectiveness" are found in the copy of the Abridgment delivered by the Applicant, but do not appear in the original Abridgment.

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AND TO

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes.]

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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to February 2, 1872, and to Appendixes from February 3 to August 2, 1872.

This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. Terms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where also single copies may be obtained at 4*d.* each, except the concluding number (containing the complete Indexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders to be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commissioners of Patents.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn.
Friday, August 9, 1872.

CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 3 to February 9, 1872.

A.D. 1872, February 3.—No. 347.

PUNSHON, Robert, of the town and county of Newcastle upon Tyne, gentleman.—" Improvements in " apparatus for measuring and registering liquids."

A float or weight is caused by its descent, as the level of the liquid in a cask or vessel becomes lowered by its being drawn off, to act by means of a cord on a drum carrying an indicator, which is thus made to register by pointing to the divisions on a stationary disc or dial.

The indications may be multiplied as required by the addition of counting wheels as usual.

The stationary disc or dial and the revolving drum are supported by a tube passed through the bung of the cask, through which tube also passes the cord from the drum to the float or weight.

A.D. 1872, February 3.—No. 348.

CUTLER, Samuel, of Lind Street, Ryde, in the Isle of Wight.—" Improvements in fastening and securing " window sashes, and preventing the rattling thereof."

The use of morticed fastenings fixed to sash stiles instead of rails. The application of plates to the pulley stiles of sash frames, and also to the stiles of sashes.

A.D. 1872, February 3.—No. 349.

CLARKE, James Langton, of The Common, Ealing, in the county of Middlesex, clerk.—" An improved " method of and apparatus for preventing candles from guttering."

The use of a tube tapering towards both ends, the upper end expanded into a saucer, the tube being made of glass, with the lower end wide enough to slip over the candle, and the upper end slightly narrower than the diameter of the candle, so that the candle comes nearly up to the top of the tube; and the use of a metal band round the outside of the tube, immediately below where it expands into the saucer form, to equalize the heat round the top of the glass tube by the conducting power of the metal.

A.D. 1872, February 3.—No. 350.

CALVERT, John Caparn, and TAYLOR, John, of Huddersfield, in the county of York, engineers and millwrights.—" Improvements in apparatus for heating water, steam, or other fluid."

This invention relates to apparatus to be placed within the flue leading from a boiler or other furnace, and consists of a series of pipes depending from boxes or chambers in pairs, that is, two pipes connected to one box or chamber, and such two pipes are coupled or connected at the bottom ends with other two pipes respectively, so that a continuous passage is formed through the whole series for water, steam, or other fluid to be passed through.

The bottom end of each coupled pair of pipes is provided with a lid or cover, so as to be readily removed for the purpose of cleansing the interior thereof. Also a series of scrapers are applied to fit to the external surface of the said pipes and pressed thereon by weighted levers, which are caused to travel up and down the said pipes by mechanical means to cleanse the exterior surface of soot, which would otherwise accumulate thereon and prevent the action of heat.

A.D. 1872, February 3.—No. 351.

TODD, William, cloth manufacturer, and WINN, David, cloth finisher, both of Leeds, in the county of York.—" Improved machinery for pressing, smoothing, and finishing woollen cloth or other fabrics."

The object of the present invention is to supersede the use of hydraulic or screw presses with flat heated plates for pressing, smoothing, and finishing woollen cloth or other fabric, and to employ in place thereof an improved construction of machinery, consisting of rollers and curved troughs, whereby the pressing and finishing process is greatly facilitated, and can be rendered continuous.

A.D. 1872, February 3.—No. 352.

McDONALD, Peter, of Black Rock, Dublin, Ireland.—"Improvements in self inking letter, bill, and "card stamping machines and endorsing apparatus."

According to this invention a hollow metal pillar is arranged so as to rest upon and be affixed to a movable dovetail or other suitable sliding base, which base is made to slide longitudinally between side slots over another base or block of iron or other metal heavy enough to insure stability. Midway on the shaft a joint or pivot is arranged so as to admit of the upper portion turning while the lower part remains fixed.

To a projecting arm pivoted on the lower end of the pillar is a lever affixed by a pivot joint.

At the outer extremity of this lever and on its under surface are attached either longitudinally or transversely the dies, stamp, or printing plate, and adjoining these at the inner side is the ink fountain hollowed out of the lever. The bottom of this ink fountain is perforated with small holes so as to permit the ink to percolate to the ink-pad, which is affixed beneath the fountain by screwed clasps. To a projecting arm fixed to the top of the shaft is pivoted a second lever which runs downwards, and on nearing the lower or first lever becomes bifurcated and bent outwards so as to carry at the extremity of the fork a roller which passes freely from the pad to the dies and vice-versa.

The upper lever is arranged to support or keep the lower lever in equilibrium by means of an inward projection of the former attached to a spiral spring or balance within the hollow of the pillar. Both levers are therefore self-lifting and move simultaneously. The same contrivance likewise keeps the roller properly pressing against the pad and dies. The handle is affixed above the dies on the upper surface and outward extremity of the under or first lever.

Altogether the handle of the apparatus moves in six different directions, upward and downward, right and left, and backward and forward. The stamp dies or printing plate can therefore be made to descend on any point within the radius of the lower lever, the varying centre by means of the sliding base giving a still further or narrower limit when required.

When it is necessary to keep both hands disengaged the machine or apparatus can be worked independent of the handle by means of a cord or band attached midway to the lower lever and passing over a double sheaf pulley fixed on the table or bench on to a treadle beneath.

The handle being screwed on and so constructed as to carry a die or stamp at each end, it can at any moment be converted into an ordinary hand stamp in case of accident to the apparatus.

When the machine is required to be used as an endorsing apparatus, or for ordinary bill or card stamping or printing purposes, the radial and longitudinal motions are not essentially needed, and therefore the shaft, pivots, and sliding base may be omitted in its construction.

It will also be of much smaller size when constructed for an endorsing machine.

A.D. 1872, February 3.—No. 353.

BLUNDELL, Walter, of 75, Mark Lane, in the city of London, gentleman.—"An improved compound "cape, applicable also for use as a bed and for other purposes."

This invention consists in a novel combination and arrangement of parts whereby an improved compound water-proof cape is produced which, when not worn as a cape, may be used as a bed or in parts serving as a railway travelling rug or otherwise, and portions of this compound cape are applicable also for carrying water or other liquid when travelling and for other purposes.

A.D. 1872, February 3.—No. 354.

BETTS, William, of Wharf Road, City Road, in the county of Middlesex, capsule manufacturer.— "Improvements in capsules, and in apparatus to be employed in their manufacture."

This invention consists of a soft metal capsule, whose side or cylindrical part is corrugated in such a manner that a space may be preserved for the name, trade-mark or signature, of the firm for whose use the capsules are intended, which name, trade-mark or signature, may be colored or plain. The advantage of this system is that the capsule has all the additional strength and resistance to indentation produced by the corrugation without losing the side or cylindrical part as a field for displaying the name, trade mark or signature of the firm using the capsule, which side marking guarantees to the public the genuineness of the articles contained in the capsuled bottle.

A.D. 1872, February 3.—No. 355.

BETTS, William, of Wharf Road, City Road, in the county of Middlesex, capsule manufacturer.—"Improvements in machinery or apparatus for capsuling bottles and other like receptacles."

This invention consists of improvements in hydraulic capsuling machines and comprises

First. A swivelling metal chamber for containing the elastic chamber.

Second. Direct perpendicular action on the plunger of the metal chamber.

Third. An arrangement for actuating the plunger by either the right or left hand or foot.

Fourth. Lining rubber or elastic chamber with leather.

Fifth. Packing the plunger by a leather washer on the end, no gland or other packing being required.

Sixth. The application of a feeding cup and tap to the metal chamber for keeping up supply of water therein.

Seventh. So shaping the machine as to render it capable of being packed in its own stand as a packing case.

A.D. 1872, February 3.—No. 356.

DENNISON, Aaron Lufkin, of Handsworth, in the county of Stafford, watch manufacturer.—"Improvements in watches and pocket chronometers."

According to this invention the bezel holding the glass and the back of the case are secured to the case by screwing them thereto instead of hinging them thereto as usual, the case is thereby made air and water tight. For the same purpose the winding arbor and the push piece for setting the hands work through packings. Instead of the ordinary winding gearing, gearing wheels are employed made of two parts one part being composed of bevilled and the other of straight teeth. In the mechanism for setting the hands the intermediate gearing is dispensed with, and the minute wheel has teeth one half straight for engaging with the cannon pinion, and the other half bevilled to be operated upon by the clutch gear for setting the hands. In place of the ratchet wheel in the winding mechanism the ordinary gear is employed, a click having two or more teeth engaging with the teeth of the said gear. The winding mechanism is arranged under a solid block secured to the bottom or pillar plate. The minute wheel works in a recess in the plate, a bridge being fixed over the said minute wheel.

A.D. 1872, February 3.—No. 357.

NORTON, James Lee, of Belle Sauvage Yard, Ludgate Hill, in the city of London.—"Improvements in stables, sheds for cattle, and slaughterhouses, and in paving or flooring for the same, and other surfaces."

This Provisional Specification describes forming the central part of the floor of a stable horizontal and of openwork paving or grating, whilst the two side portions slope downwards towards the central strip of paving, below which are inclines leading to a pit or to a gutter. The openwork paving or grating of the central strip is supported on wooden bearers forming part of a wooden frame, which is dropped into a recess formed to receive it. Frames covered with matting are in some cases hinged to the sides of the stall.

Paving suitable for the central strip and pavings suitable for the side strip are also described, and these may be used for paving other surfaces.

A.D. 1872, February 3.—No. 358.

BURGESS, Edward, of Mountroy, in the city of Wells, in the county of Somerset.—"Improvements in apparatus for evaporating and incinerating alkaline lyes or solutions ordinarily used in the manufacture of paper, and in the treatment of such solutions when spent for the purpose of recovering therefrom valuable chemical products."

This Provisional Specification describes apparatus for evaporating and incinerating alkaline lyes which have been used for treating esparto grass, straw, or other vegetable fibre in the manufacture of paper, and to a method of treating such solutions to recover the alkali.

The spent lyes are evaporated in a pan within which are heating pipes supplied with steam from a steam boiler under pressure. The greater part of the water is evaporated from the lyes in this pan, leaving a thickened residue which is run down to the beds of furnaces below the boiler and subjected to the incinerating process. There are two furnaces, one at each end of the boiler, and they work independently of each other. One of the furnaces is kept in a state of active combustion while the other is being raked out, re-fed, and re-fired.

A.D. 1872, February 5.—No. 359.

WELDON, Walter, of 29, The Cedars, Putney, in the county of Surrey.—" Improvements in obtaining " and decomposing sulphate of sodium and sulphate of potassium, and in obtaining hydrochloric acid and " chlorine."

Sulphate of sodium or sulphate of potassium and hydrochloric acid are produced under this invention by treating a mixture of chloride of sodium or chloride of potassium and sulphide of manganese with air and steam at a suitably high temperature, or by treating a mixture of chloride of sodium or chloride of potassium and oxide of manganese with sulphurous acid gas and air and steam, or by treating a mixture of chloride of sodium or chloride of potassium and either oxide of manganese or oxide of iron with steam and sulphuric anhydride. The sulphate in mixtures of sulphate of sodium or sulphate of potassium and oxide of manganese or oxide of iron, produced as above or otherwise, is decomposed by treatment with a suitable reducing flame or with carbonic oxide at a high temperature, and the soluble product of such decomposition is then dissolved out and suitably utilized, and the insoluble residual sulphide of manganese or of iron employed to produce more sulphate of sodium or sulphate of potassium.

A.D. 1872, February 5.—No. 360.

VALE, William, of Birmingham, in the county of Warwick, manufacturer.—" Improvements in watch " keys."

The features of novelty which constitute this invention consist substantially in forming the required hole or aperture in the pipe in the manner described, and the pipe being afterwards cut into four equal segments or divisions by means of a circular saw, these segments are caused to have a tendency to spring outwards by means of a portion of the metal immediately underneath the key pipe being hollowed out by turning. A cap or tube is then caused to screw upon the key pipe, and by its means the segments of the pipe are held securely in either of their more extended positions, or are at pleasure compressed together so as to fit any sized watch to which the improved key may be desired to be applied.

A.D. 1872, February 5.—No. 361.

CUNNINGHAM, James Glencairn, of Ramsgate, in the county of Kent, chemist, and **CORBIN, Joseph**, of the same place, manager of the Granville Hotel.—" An improved agent to be used in the preparation or production of baths."

An extract of sea weed, sea wrack or fucus is prepared preferably in vacuo. It is iodized by iodide of potassium or other salt, and ozone is passed through the product. This agent is dissolved to prepare or produce the bath.

A.D. 1872, February 5.—No. 362.

BELL, Albert George, of Wardour Street, Oxford Street, in the county of Middlesex, doctor of medicine.—" An improved galvanic belt."

By this construction of galvanic belt, no acids or supplementary excitants are required to generate electrical action between the positive and negative plates, the moisture emanating from the body of the patient being absorbed by layers of cloth fixed between every pair of plates, and thus maintaining a constant action without the necessity of removing the belt to apply exciting agents. The plates are arranged within the belt in pairs. Copper on zinc and then fabric throughout the series, and the terminals are brought by wire springs to concave discs of copper and zinc for application to the body as required.

A.D. 1872, February 5.—No. 363.

BROUGH, Robert, of Sunderland.—" Improvements in steam engine governors and speed regulators " for machinery."

These improvements relate to that description of governor known as the fly wheel governor, the action of which depends upon what may be termed the principle of differential velocities, and consists partly in simplifying this form of governor by dispensing with superfluous parts, thereby effecting economy in first cost, but mainly in rendering more certain, prompt and efficient its action by improved construction arrangements, and disposition of parts. The use of radius or radial links with universal or ball and socket joints, and the mode and manner in which they are placed, and likewise a shifting arm on the hollow shaft for regulating the force of governor (as the speed of the engine may require) and also the friction between enlarged boss on band pulley shaft and inside of hollow shaft which assists to drive fly wheel, therefore dispensing with the spring by regulating the pull of band on pulley, the friction being increased or decreased as may be required to keep up momentum of fly-wheel to its proper speed. The sliding tube has a slot to admit an arm to allow the tube to slide backward and forward as the travel of governor may require.

A.D. 1872, February 5.—No. 364.

OLDROYD, Allen, of Leyton, in the county of Essex, india rubber pouch manufacturer.—"Improvements in the manufacture of india rubber and other tobacco pouches and purses."

This invention relates, first, to the method of arranging and cutting out the parts or pieces of india rubber for making up into tobacco pouches or purses whereby increased facility is afforded for uniting the edges of the india rubber in putting the parts together; the invention also relates to improvements in forming or shaping india rubber tobacco pouches and purses so that they are supported in an erect position upon a comparatively flat base or bottom.

Another part of this invention relates to improvements in the construction of the frames for closing and opening the mouths of india rubber tobacco and other pouches and purses.

A.D. 1872, February 5.—No. 365.

FIELD, Edward, of Chandos Chambers, Adelphi, in the county of Middlesex, consulting engineer, and **COTTON, Francis Michael**, of Foulis Terrace, Kensington, in the same county, civil engineer.—"Improvements in steam engines."

According to this invention a reciprocating high pressure cylinder or chamber is arranged wholly within a low pressure cylinder or chamber with their axes parallel to each other, the two cylinders being by preference concentric. The high pressure cylinder forms the piston of the low pressure cylinder, or is connected to the said piston and moves with it entirely. Within the low pressure cylinder or chamber the piston of the high pressure cylinder is fixed and maintains a constant position relatively to the low pressure cylinder.

The admission and emission of the steam to and from the respective cylinders is regulated by suitable valves which may be arranged within a suitable valve chamber formed in the body or casting of the above described combined high pressure cylinder and low pressure piston, and furnished with suitable ports passages, or ways which are opened or closed as required by the said valves. These valves according to one arrangement are moved by steam admitted into or retained in the ends of the low pressure cylinder acting on small pistons, which act as valves for opening and closing the communication between the high pressure cylinder and the low pressure cylinder, and are also connected with other valves for regulating the exhaust.

It may be found advisable in some instances to employ more than one cylindrical valve chamber provided with valves and small pistons as described, and such valves and small pistons may in some cases be actuated by mechanical means. The combined high pressure cylinder and low pressure piston is provided between its ends or covers with ribs, feathers, or pieces which serve as steam tight partitions fitting steam tight against the inner surface of the low pressure cylinder, thus forming chambers between the two cylinders into which steam from the boiler constantly flows for supplying the high pressure cylinder and other similar chambers through which the exhaust steam escapes.

In some cases the ribs, feathers, or pieces above described may be dispensed with, and, in addition to the small pistons for establishing the communication between the high and low pressure cylinders, other pistons or valves may be arranged in a separate valve chamber arranged longitudinally or otherwise outside of the low pressure cylinder for opening and closing the exhaust passages from the low pressure cylinder, such additional pistons or valves being moved by steam or mechanical means. Or the ports, passages, or ways communicating with the high pressure cylinder may be formed through the rod of the fixed high pressure piston, other ports, passages, or ways being provided for the low pressure cylinder, so that the ports, passages or ways leading to the respective ends of both cylinders and to the steam supply and exhaust may be opened and closed as required by suitable valves arranged by preference on the cover of the low pressure cylinder, and actuated partly by mechanical means and partly by steam.

The admission and emission of steam to and from the cylinders of direct acting double cylinder engines of the above and other kinds is effected by providing each cylinder with a hollow main steam slide containing an auxiliary slide, and causing the piston of one cylinder to actuate its own main steam slide and the auxiliary slide of the other cylinder's main steam slide.

A.D. 1872, February 5.—No. 366.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Joseph Numa Gateuil, of Paris, in the Republic of France.*) —" An improved manufacture of pocket and other diaries."

The object of this invention is to bring under the notice of the users of diaries of whatever class such information as has a special interest for them. To this end each leaf of the pocket book or diary, besides providing space for the insertion of current memoranda, will contain printed information relating to the profession or class for whom the diary is designed.

A.D. 1872, February 5.—No. 367.

NUSSEY, George Henry, of Leeds, in the county of York.—" Improvements in asphalte pavement."

This invention consists in moulding or cutting asphalte pavement into corrugated, indented, cross cut, or other shape, whereby a raised or irregular surface is obtained, and slipping is prevented.

A.D. 1872, February 5.—No. 368.

SEYD, Ernest, of Princes Street, in the city of London.—" An improved method of casting bars or plates " of silver and gold, and the moulds for such purpose, also an improved method of rolling such said bars " to reduce them to the proper thickness for manufacturing into coins and medals."

The principal features of novelty in this invention consist—Firstly, in heating the moulds in which the metal is cast to a red heat, or about that heat. Secondly, in the construction of the moulds and mode of lubricating them. Thirdly, in using rollers for rolling the cast metal of a mill stone shape, namely, thicker or larger in diameter than they are long, to ensure uniformity of thickness during the rolling of the metal. Fourthly, in cross rolling the metal, that is to say, after it has been first rolled in one direction, afterwards rolling it at about right angles to the first rolling, to restore the temper of the metal, which is brittle when rolled in one direction only.

A.D. 1872, February 5.—No. 369.

PACE, Edmund, of Bow Common, in the county of Middlesex. — " Improvements in machinery or " apparatus for cutting splints."

The invention relates to that class of machinery in which a series of lancets or scoring knives are caused first to cut the wood to the depth of a splint, and then a slicing knife is made to act at or about right angles to the path of such scoring knives to cut off the splints from the wood.

A.D. 1872, February 5.—No. 370.

RYDILL, George, of Grove House, Dewsbury, in the county of York, merchant.—" Improvements in " machinery and apparatus for dyeing or staining animal and vegetable substances, also suitable for drying " the same and for bleaching purposes."

This invention consists of improvements in machinery and apparatus for dyeing or staining animal and vegetable substances, such as wool, hair, silk, cotton, and avoiding the winceing of piece goods, and facilitating the process of dyeing or staining every description of color; also applicable for other purposes.

A.D. 1872, February 5.—No. 371.

WILKINSON, Samuel Wright, of Stockport, in the county of Chester, cotton spinner.—" Improvements in machinery and apparatus for winding and balling yarn."

My invention consists in certain improvements upon a machine now known and in use, by which the yarn drawn off a warp beam is wound on a short lap or bobbin called a ball.

Another part of my invention consists in applying the winding or balling machine, above referred to, to the ordinary beaming machine, by which combination the operation of chaining the yarns is dispensed with, thereby economising labor and expense.

A.D. 1872, February 5.—No. 372.

HULME, SAMUEL FLETCHER, decorator, and **HULME, GEORGE**, decorator, both of 18, Jordangate, Macclesfield, in the county of Chester.—"A new description of covering for floors, with designs or patterns "of great durability."

Made by a combination of felted cloth and an oily composition, thereby producing a covering for floors of great flexibility and durability.

The production of a washable floor covering, with patterns either partially or entirely sunk into and through the same, so that when the surface of the cloth is worn away the pattern is not obliterated, as in the case of ordinary floor cloth.

A.D. 1872, February 5.—No. 373.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Benjamin Morison, of Philadelphia, Pennsylvania, United States of America.*)—"Improvements in the manufacture of sheet iron."

The nature of my invention consists in deoxidising the scale oxide adherent to sheet iron and amalgamating, blending, or intimately uniting with it any of the softer and more fusible metals; the object of the said invention being the rendering of the said scale-oxide more flexible, soft, adherent, and less liable to rust, and the sheet iron more perfectly annealed and flexible.

A.D. 1872, February 5.—No. 374.

EDWARDS, JOHN, of Cassland Crescent, South Hackney.—"Improvements in locks."

Making locks with a central action to prevent undue pressure on one side of such action, making the tongue to stop up the slot when the lock is in action, and making the handles of cast iron and casting them with a superior metal.

A.D. 1872, February 5.—No. 375.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 6, Piccadilly, in the county of Middlesex, and 18, Rue de la Chaussée d'Antin, Paris, France, patent agent.—(*A communication from Almon N. Allen and Rodney H. Dewey, two persons resident at Pittsfield, state of Massachusetts, United States of America.*)—"Certain improvements in apparatus for lighting gas by electric currents or otherwise."

This invention relates to certain improvements in apparatus for lighting gas by electric currents in which a magneto-electric machine is used to produce the required spark, or in which a galvanic battery or an electric machine based on friction is used to produce the required spark, or in which the gas is lighted by the explosion of a fuse.

A.D. 1872, February 5.—No. 376.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Edouard Beckman-Olofson, a person resident at Strasbourg, Alsace Lorraine, Swedish gentleman.*)—"New and "improved alimentary drink."

This invention consists to make a new and improved wholesome, alimentary, and economical drink by using rye or preferably rye malt and dried barley malt torrified, pounded, and mixed together and combined with the aroma of natural coffee and a little burnt sugar.

A.D. 1872, February 5.—No. 377.

LAMB, GEORGE WATSON, of No. 119, Borough Road, in the county of Surrey, engineer.—"Improvements in the manufacture of boots and shoes, and machinery or apparatus to be used therein."

According to this invention the heels are built up in one machine and affixed to the boot or shoe in another machine. The "lifts" (which are previously pasted together) are compressed in a mould or die at the bottom of which is a block called the 'nail-block' in vertical holes, in which block the nails for securing the top pieces to the bodies of the heels are inserted points upwards, their heads resting on needles which enter the said holes, the block and needles being so mounted that on pressure being applied to the "lifts" the said nail block retires and the nails are forced into the leather forming the heel. The heels are affixed to boots or shoes by means of a machine consisting of a nail block of the kind hereinbefore described, the height of which can be regulated by screws and wedges and, which may be slidden under or moved away from a vertical plunger which is caused to descend when required by a crank or excentric on a shaft worked by suitable gearing. The boot or shoe to which a heel is to be affixed is placed sole upward on the nail-block and the heel laid on it. The nail block is then slidden under the plunger, which being caused to descend forces the nails into the boot and heel.

A.D. 1872, February 5.—No. 378.

HOLLAND, Henry, of Birmingham, in the county of Warwick, tool maker.—"Improvements in clippers "for clipping or shearing horses and other animals."

According to this invention the moveable cutters of the clippers are made automatic or partly automatic. Two toothed cutting plates one fixed and the other moveable or a rotating cutting roller having a helical cutting edge and a fixed cutting plate are employed. A reciprocating motion is given to the moveable cutting plate by means of two pinions each having two teeth only gearing alternately with a rack on the moveable cutting plate, one pinion coming into gear when the other pinion is gone out of gear. The shafts carrying these pinions are geared together by other pinions and are made to rotate in opposite directions. Rotatory motion is transmitted to the shafts through a train of wheels driven by a spring barrel.

When a rotating cutting roller and a fixed cutting plate are employed, a rotatory motion is given to the cutting roller by a pinion on its end which is driven by a train of wheels and spring barrel.

When the moveable cutting plate is worked by hand a reciprocating motion is given to it by a pair of evers or handles. One handle is fixed to the stationary cutting plate or covering cap, and the other and moveable handle has at its top a tooth or stud which takes into a rack or cup fixed on the moveable cutting plate. A spring between the handles tends to separate them. By closing the handles by the hand the moveable plate is moved in one direction, and by relaxing the pressure the spring separates the handles and gives the return motion to the moveable plate.

A.D. 1872, February 6.—No. 379.

PRANGE, Francis Gerard, of Liverpool, in the county of Lancaster, merchant, and **WHITTHREAD, William**, of the same place, analytical chemist.—"Improvements in the utilization of sewage."

First. In adding to and mixing with liquid sewage a solution of di-calcic-phosphate in an aqueous solution of mons-calcic-phosphate with an alkaline earth or alkali, say lime, so as to precipitate the nitrogenous and manurial matters held in solution and suspension.

Second. In adding with the above mentioned chemicals, when there is an excess of free ammonia, magnesium salts.

A.D. 1872, February 6.—No. 380.

MENDEL, Sam, of Manchester, in the county of Lancaster, merchant.—"An improved mode of, and "apparatus for applying colour to blocks for stamping trade marks on woven fabrics."

My invention consists in so constructing the colour troughs and supplying the colours to them that trade marks of two or more colours can be stamped at one operation, thereby producing trade marks that are more ornamental and more easily recognized than those produced of one colour in the ordinary manner.

A.D. 1872, February 6.—No. 381.

HULSE, William Wilson, of Manchester, in the county of Lancaster, engineer, and **McKAY, Benjamin Thomas**, of the same place, engineer.—"Improvements in and relating to the manufacturing of "floor cloth."

According to this invention wool or worsted animal hair, linen, and jute are made into a pulp in rag engines and formed into a web resembling coarse paper, which is dried and then saturated with oil and colour. The said web is then stoved, and after having been coated on one side with oil paint is again stoved. It is then coated on one side with an adhesive cement made from boiled oil and earthy matter, and is united to prepared canvas by passing the web and the canvas between heated rollers. The fabric may now be printed and be stoved until sufficiently seasoned. The stove is heated by forcing in dry or humid heated and filtered air, and the said stove is lighted by lamps protected by wire gauze or glass to lessen the risk of fire.

A.D. 1872, February 6.—No. 382.

BIRDSALL, Richard, of Northampton, in the county of Northampton, wholesale bookbinder and manufacturing stationer.—" Improvements in ornamenting book covers and similar articles, also applicable " to the ornamentation of leather, vellum, cloth, and other like surfaces."

This invention consists : First, in the employment of a sheet of paper, canvas, or other material called a " stiffener," for stiffening the material forming the cover of the book, and to ensure true working edges during the color printing, and then impressing in blind and gold, thus making the material sufficiently thick to receive the impression from the metal die before the addition of boards.

Second. The combined process of printing upon the inner surface of the material, the angles of two parallelograms indicating the future position of the boards in printing the surface in colors from a plane stone or metal surface, and afterwards in impressing in gold by a heated metal die or block.

Third. Printing in colors from a plane metal or stone upon the surface of the material, and afterwards impressing in gold or blind by a heated metal die or block.

A.D. 1872, February 6.—No. 383.

BELL, James, of Droylsden, in the county of Lancaster.—" An improved shedding motion for looms for " weaving fancy fabrics."

The improved shedding motion which forms the subject of this invention, consists of an apparatus somewhat similar to a " Jackquard machine," whereby I am enabled to work the required number of shafts or healds in both directions (that is both upwards and downwards) by means of needles and perforated cards, and thus to dispense with the use of weights or springs.

A.D. 1872, February 6.—No. 384.

PHILLIPS, John, of Glasgow, in the county of Lanark, North Britain, ship-furnishing ironmonger.— " Improvements in ship's signal lamps."

The invention consists in corrugating or indenting the reflector, and in combining such corrugated reflector placed behind the light with a lens placed in front of the light whereby the desired object is attained.

In applying the invention to a mast-head lamp, it is preferred to furnish the lamp with two burners or lights, and to apply between and behind such burners either two reflectors or one continuous reflector, presenting two corrugated or indented concavities arranged to spread the light laterally to a greater or less extent.

A.D. 1872, February 6.—No. 385.

SUTHERLAND, William Seddon of Warrington, in the county of Lancaster, engineer.—" Improve" ments in welding or uniting plates, tubes, and other forms of iron or steel, and in means or apparatus " employed therein."

This relates to the system of and apparatus for welding patented in 1869, No, 2487.

First. The air used to support combustion or the gaseous fuel employed in combustion, or both is or are heated.

Second. Air is mixed with the gaseous fuel, or gaseous fuel with the air in such quantity that an explosive mixture is not formed.

Third. The furnace is placed over the article to be welded, and a reflector of fire brick or other material placed underneath such article, the object being to prevent choking.

Fourth. A series of tubes and annular orifices are employed to conduct air and gaseous fuel, or these mixed from the containers to the combustion chamber, and they are so disposed close to each other, that a long straight or curved line of flame is produced at the heating orifice.

Fifth. The tubes and orifices for the outflow of air and gaseous fuel, or these mixed, are disposed in such manner that the lines of outflow of the air and gaseous fuel converge towards the longitudinal centre line of the heating orifice.

Sixth. The delivery ends of the tubes and passages for air and gas, or these mixed, are made of a taper form for the purposes of concentrating the flame at the heating orifice.

Seventh. So as to ensure that the air and gaseous fuel, or these mixed, are delivered at the same rate at all the tubes or passages of the series I insert, in the mixing or the air and gaseous fuel chambers, diaphragms placed in a zig zag manner or disposed at varying heights.

Eighth. Heated tubes are moved from my furnaces underneath the hammer by a draw bench or other appliance.

Ninth. Employing in combination with a furnace having any or all of the improvements above described a hammer and anvil mounted on a carriage or otherwise arranged or instead of a hammer and anvil, two hammers working opposite each other.

A.D. 1872, February 6.—No. 386.

TITLEY, Robert, of Birmingham, in the county of Warwick, brass founder.—" Improvements in louvres " and louvre blinds, and in fittings or mechanism for actuating, adjusting, and fixing louvres and louvre " blinds for various purposes."

According to this invention the louvres are made to turn upon axes situated near their inner edges, so that when the louvres are opened they do not project inside the carriage, the projecting parts of the louvres being external. The louvres are jointed to the inner face of a flat rod crossing the middle of the louvre blind. The raising and lowering of this rod closes and opens the louvres. The bottom of the rod slides in a guide on the lower edge of the blind frame, a spring in the guide pressing upon the rod and producing sufficient friction to maintain the rod and louvres in any position to which they may have been brought. The closing of the louvres is ensured before the blind frame is let down into the lower half of the carriage door, by means of a slide connected with a lever jointed to the top of the actuating rod of the louvres. The upper part of the slide crosses the top edge of the frame, and when the louvres are opened, stands a short distance above the said top edge. On lifting the louvre frame to its full extent, preparatory to its depression into the lower half of the carriage door, the cross piece of the slide strikes against the upper edge of the door frame, and being pressed down thereby acts upon the actuating rod described, and closes the louvres.

A.D. 1872, February 6.—No. 387.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Joseph Symonds Foster, of Salem, Massachusetts, United States of America.*) —" Improvements in engines to be operated by gunpowder or other explosive material."

My invention consists substantially in the arrangement of devices by which two vibrating arms carrying hammers are simultaneously swung or driven out by the explosion of a charge of gunpowder or other explosive material in a suitable chamber; also in the conversion of the motion thus derived into a rotary motion, and by these means obtaining a constant power through the intermittent discharge of the explosive material used.

A.D. 1872, February 6.—No. 388.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Lucien Henri Blanchard, Ivar Bang, and Louis Léon Henri Provost, all of* 13, *Boulevart St. Martin, Paris.*)—" Improvements in the treatment of sewage and other ammoniacal liquors, and in the " manufacture of certain salts for this purpose."

The invention consists in the application and employment of bi-magnesian and calcio-magnesian phosphates, for acting on and fixing ammonia contained or forming in liquid sewage and gas liquids and in other solutions, and also in the methods of manufacturing the said salts.

A.D. 1872, February 7.—No. 389.

BAUMANN, Alexander, of Vauxhall Iron Works, Wandsworth Road, in the county of Surrey, engineer. —" Improvements in steam engines."

This invention consists in certain arrangements whereby the valve action of steam engines is greatly improved, and which arrangements are especially applicable to steam engines without rotary motion, for example, such as are used for driving pumps and other reciprocating machines.

A.D. 1872, February 7.—No. 390.

TIMBRILL, Robert, of The Towers, in the parish of Beckford, in the county of Gloucester, esquire.—(*A communication from James Harrison, of Chicago, in the United States of America, esquire.*) — "Making "gloves and mittens without seams in the palm of the hand or around the base of the thumb, and with "less seams in the fingers of the said gloves than in ordinary gloves."

There are no seams in the palm of the hand or around the base of the thumb of such gloves and mittens, and there are less seams in the fingers of the said gloves than in ordinary gloves.

A.D. 1872, February 7.—No. 391.

BILLING, Charles Eardley, of No. 90, Hatton Garden, in the county of Middlesex.—"Improvements "in apparatus for heating by the flame of gas."

The invention has reference to that character of apparatus for heating by the use of the flame of gas for which Letters Patent were granted to Clinton Edgecombe Brooman bearing date the 16th day of January 1868, No. 146, and the improvements consist in forming the partitions for producing the chambers for the circulation and heating of the air as it passes through such stoves, so that the light of the gas used may pass therethrough, and relates to forming the partitions of sheets of talc or mica set in metal frames by which, whilst the chambers for the circulation and heating of the air are retained, facility is afforded for the passage of light through such partitions and by the use of a cover formed to represent lumps of coal with] apertures between; facility is also afforded for giving the appearance to some extent of ignited coal.

The covers or parts thereof representing lumps of fuel are formed of cut, cast, or moulded glass colored if desired to represent incandescent fuel.

A.D. 1872, February 7.—No. 392.

BEAUMONT, Frederick Edward Blacket, of No. 2, Westminster Chambers, Victoria Street, in the city of Westminster, Captain in the Royal Engineers, and **APPLEBY, Charles James**, of Emerson St., Southwark, Surrey, engineer. — "Improvements in rock or stone drilling, tunnelling and boring "apparatus."

This Complete Specification describes machines in which a tubular cutter (or cutters) is employed having diamonds or gems set around it.

The claims to the Specification are,—

1st. The construction of the rock drill substantially as described.

2nd. The construction of the tunnelling machine substantially as described.

3rd. The construction of the boring or prospecting machine substantially as described and illustrated at figures 11 and 12.

4th. The construction of the boring or prospecting machine substantially as described and illustrated at figures 13, 14, 15, and 16, and also the modification herein described of this machine to adapt it for working with an ordinary jumping boring tool.

5th. The construction of the cutters in manner substantially as described in respect to figures 17, 18, and 19.

A.D. 1872, February 7.—No. 393.

SELLARS, John, of Droylesden, near Manchester, in the county of Lancaster, manufacturing chemist.— "Improvements in the manufacture of size or other substances used for stiffening and weighting cloth, "yarn, and paper."

This invention consists in the employment of ordinary slate or the mineral from which the slate is quarried in Wales and other places in a state of fine dry powder, or of fine wet pulp, and using it in both conditions as articles of commerce either with or without the addition of any coloring matter.

The slate of different colors is selected as desired and ground to any degree of fineness in the dry or moist state, and this powder or pulp in its natural color is well adapted for stiffening and weighting cotton or other cloth or yarns in the sizing machine, when mixed with flour, starch, or other pasty or gummy substance, or any other mineral or weighting material may be added thereto at the option of the user. The dry powder or moist pulp, whether colored or not, can be used in the manufacture of paper either used alone or in combination with china clay or other similar substances for giving weight or color, or both weight and color.

The dry powder or moist pulp can be colored to any tint required, and be used in the manufacture of pigments or colors either alone or in combination with barytes or similar substances, such as are now or may become in use at the option of the manufacturer.

A.D. 1872, February 7.—No. 394.

TAYLOR, Francis, of Manchester, in the county of Lancaster.—" Improvements in the construction of " bedsteads for invalids."

According to my invention the patient is laid upon a sheet stretched upon a frame, but instead of the latter being movable it is a fixture, and the frame beneath it which carries the mattress and bedding is capable of being lowered away from it, so as to leave the patient suspended in the sheet whilst the bed or bedding is changed or re-arranged. An opening is made about the centre of the sheet for the sake of convenience. All the wants of the patient can therefore be attended to, and the bed made without disturbing him in any way, and the mattress and bed may be then raised to their former position.

A.D. 1872, February 7.—No. 395.

SMITH, George, of No. 151, Strand, in the county of Middlesex, saddler.—" An improved instrument " for clipping hair or wool from horses or other animals."

The invention relates to improvements in apparatus for clipping hair or wool from animals, and such improvements consist in placing a bar or rest on the underside of the lower or fixed plate of the apparatus, in placing a spring in such position as to assist in opening the right handle or lever thereof, and in causing the right handle or lever by an extension of its point to work in a slot (elbow formed), thus effecting double cutting action of the teeth by a single opening and closing movement of the handles.

A.D. 1872, February 7.—No. 396.

HENMAN, Charles, of No. 7, Bedford Villas, Croydon, in the county of Surrey, a Fellow of the Royal Institute of British Architects.—" A new and improved method of constructing hot or tepid and cold sea, " river or spring water, plunge or swimming baths for use on land or water."

The novelty of my invention consists in a combination of one or more channels, tanks, or baths, &c., to be supplied with hot, or tepid, or cold sea, river, or spring water. Such channels, tanks, or baths, &c., are constructed upon a parallel or concentric arrangement in regard to the heating apparatus and with each other, and may be of any number and of any section, and either circular, square, rectangular, oval, elliptical, polygonal, or irregular on plan, and be either continuous in each parallel or concentric arrangement or in segments, and enclosed in buildings or open to the air, or partly enclosed and partly open, so as to enable bathers or swimmers with facility to use and enjoy hot, tepid, or tonic sea, river, or spring water plunge or swimming baths in succession, or vice versa, and on land or upon the water.

A.D. 1872, February 7.—No. 397.

HARRIS, Joseph, of Birmingham, in the county of Warwick, smith, and **NORMINGTON, Daniel**, of Birmingham, aforesaid, fitter.—" Improvements in the joints of metallic bedsteads, sofas, couches, and " other articles of like manufacture."

According to this invention a block is cast on the ends of the angle bars consisting of two branches, one horizontal and the other vertical, the said branches projecting a short distance beyond the inner and outer faces of the bars. The front and back faces of the block are slightly inclined. These blocks are dropped into recesses of a corresponding shape formed in the corner block. These joints are very strong and steady, the vertical branch of the block on the angle bar giving steadiness and rigidity in a vertical plane, and the horizontal branch of the block giving steadiness and rigidity in a horizontal plane.

A.D. 1872, February 7.—No. 398.

MORRALL, Edward, of Astwood Bank, near Redditch, in the county of Worcester, machinist.—" Im- " provements in machinery employed in the manufacture of sewing machine needles."

This invention consists of improvements in reducing machines by which the blade and shoulder parts of sewing machine needles are reduced or shaped by a turning process from lengths or pieces of wire having the diameter of the stems of the needles to be made.

The cutter is supported in a slide rest which has a traversing motion given to it to carry the said cutter against the rotating length of wire fixed in the spindle of the machine. These improvements consist principally of an adjustment wheel on the end of the adjusting screw of the cutter for giving a very fine adjustment to the said cutter for the formation of the blade part of the needle wire, and also of a depending arm on the said screw acted upon by a fixed upright of the machine for withdrawing the cutter at the proper time for the formation of the shoulder part of the needle wire. The adjustment wheel is divided on its periphery, and is prevented from rotating by a tooth or pawl engaging in one of the divisions of the said wheel, the said wheel is however capable of sliding on its locking pall or tooth. The motion of the depending arm is limited by an adjusting stop, a jointed catch fixing the said arm and preventing the advance of the cutter, while the slide rest makes its return motion after the needle wire has been shaped.

By these improvements great uniformity in the size and shape of the blade and shoulder parts of the shaped or reduced wires are secured, little waste is made, and the adjustment of the cutter is effected with great accuracy.

A.D. 1872, February 7.—No. 399.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from George Valentine Sheffield, of Providence, and Godfrey Kaye Mellor, of Woonsocket, both in the county of Providence and state of Rhode Island, United States of America.*)—" Improvements in sewing " leather and other thick or tough material and in machinery and thread for the same."

This invention relates to a new sewing machine, a new method of sewing, and a new kind of thread, and is more particularly designed for use on leather or other tough material.

The thread is made in alternate double pointed or double conical sections, the thinner part of which is drawn through the hole in the leather, until the thicker part is firmly wedged therein and so held without loops or knots.

The improvements in the machine consist in the employment of a peculiar double tube and thread feed, one tube rotating continuously while the other oscillates to thereby ensure the requisite action; also in the arrangement of a reciprocating awl for punching and feeding the leather, and of a reciprocating hook or needle for drawing the thread through the hole in the leather, and thereby completing the stitches.

The awl is made of prismatic form, pointed and grooved at the sides, and the needle is made like the awl and provided with barbs near the point for catching and cutting the thread.

Also in the combination and arrangement of parts constituting the mechanism for operating the said double tube.

A.D. 1872, February 7.—No. 400.

JONES, Edward, of St. Luke's Road, Birmingham, in the county of Warwick, machine smith.—" An " improved construction of military spade or shovel."

The object of this invention is to provide the soldier with a spade or shovel which shall be as efficient as an ordinary military spade for field work, and which at the same time will offer facilities for being carried as a part of the soldier's accoutrements.

A.D. 1872, February 7.—No. 401.

STOCKWELL, Norris Parmby, of No. 64, Regent Street, in the county of Middlesex.—(*A communication from the Howe Machine Company, of Bridgeport, state of Connecticut, United States of America.*— " Improvements in sewing machines."

This Provisional Specification describes apparatus for regulating the length of stitch when a serrated feed plate acting on the underside of the fabric is used. This is effected by varying the position of the fulcrum of a lever which is acted on by a cam and is jointed to a bar which carries the serrated feed plate. The fulcrum is formed by the end of an arm, which arm stands out from a horizontal axis. The axis can be turned by the turning of a screw which screws through the bed plate. Apparatus for raising the presser foot and an improvement in the construction of barrel cams of sewing machines is also described.

A.D. 1872, February 6.—No. 402.

NAPIER, James Murdoch, of York Road, Lambeth, in the county of Surrey. — "Improvements in "weighing machines, applicable especially to the weighing of coins and coin blanks."

This Provisional Specification has reference to machines for weighing or classifying or separating according to their weights coin and coin blanks, and in which the whole of the operations of placing the pieces in succession on the weighing place, setting the balance into and out of operation, and delivering the pieces are performed by instruments actuated by an axis which is rotated continuously either by hand or driving mechanism.

A.D. 1872, February 7.—No. 403.

WILLOUGHBY, William, WILLOUGHBY, Joseph, and WILLOUGHBY, Samuel, all of Plymouth, in the county of Devon.—"Improvements in steam stamping machines for ores and other hard "substances."

This invention is applicable to that class of stamping machines in which one or more cylinders having pistons (to the rods of which the stamp-heads are attached) working therein are employed, and consists in conveying the exhaust steam into one or more condensers, which are not connected with or worked from any moving part in connection with the cylinder or cylinders. The condenser is provided with air and other pumps.

A.D. 1871, February 7.—No. 404.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Eugene Leconte, of Paris, France.*)—"Improvements in the production of alcoholic "and other fermented liquors."

The essential feature of this invention is the application and use to and in the manufacture of alcohols, gin, vinegar, and other fermented liquors of the starch of maize, rice, and other cereals, in lieu of the fecula of potatoes.

The said starch under the action of the diastase of the barley being converted into dextrine and sugar, which is subjected to fermentation and distillation in the usual manner.

A.D. 1872, February 7.—No. 405.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Alonzo Hitchcock, of the city and state of New York, United States of America.*)—"An improved method of combining earthy or mineral substances with vegetable substances."

I take any vegetable fibrous material, such as flax, hemp, cotton, paper, felt, cloth, and treat it with sulphuric acid, chloride of zinc, or any other suitable re-agent, as in the ordinary method of making what is known as vegetable parchment or substances analogous thereto, the design being to bring the vegetable fibre or material, either on its surface or throughout the entire mass, into a gelatinous state, and while it is in this gelatinous state cover or incorporate with the surface or mass the substance which it is desired to unite with it and allow it to become embedded in or adherent to the gelatine.

A.D. 1872, February 7.—No. 406.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Albert Hamilton Emery, of the city and state of New York, United States of America.*)—"Improvements in weighing machines."

This invention of improvements in weighing machines relates, first, to machines whereby the horizontal movement in the platform of weighing machines may be prevented.

Secondly, to the method of receiving the pressure from the load to be weighed and transmitting a fractional portion thereof to the scale beam; and thirdly, to the construction and arrangement of the levers and their connections, composing the scale beam, also to the construction of the weights employed, & the method of connecting them to the scale beam.

A.D. 1872, February 8.—No. 407.

GIBB, THOMAS, and GELSTHARP, CHARLES, both of Jarrow-on-Tyne, in the county of Durham.—"Improvements in the construction of furnaces for carbonating or drying alkaline salts and other substances "and in the method of working the same."

This invention consists in using a horizontal revolving pan instead of the working bed ordinarily employed in reverberatory furnaces. The stirring of the substances under treatment is effected by means of a plough-shaped stirrer. A loose ball, roller, or other suitable apparatus is employed to crush any lumps formed in the mass of material under treatment.

A.D. 1872, February 8.—No. 408.

ROWLEY, THOMAS, of Manchester, in the county of Lancaster.—"Improved apparatus for lubricating "spindles used in preparing, spinning and doubling cotton and other fibrous materials."

This invention consists of an oil cup or vessel to be applied to the spindles & so constructed as to afford a constant supply of oil to the said spindles and to prevent waste.

I employ a cup or vessel of metal, hard wood, vulcanite or other suitable material, of a cylindrical or other convenient form to contain the oil through the centre of which the spindle passes. This cup or vessel has a false bottom with a hole through it sufficiently large to admit the spindle, and beneath this is a washer fitting the spindle closely and kept in its place by the loose bottom of the cup or vessel which is screwed or otherwise attached.

A.D. 1872, February 8.—No. 409.

GOMBERT, PIERRE JOSEPH NARCISSE, of Paris, in the Republic of France, but temporarily of 4, South Street, Finsbury, in the county of Middlesex, civil engineer.—"Improvements in railway breaks."

The improved break is composed of two parts or blocks, the lower one of which is forced down on to the rail by means of a horizontal bar placed between the two blocks and actuated by the buffers of the carriage when the speed of the engine is suddenly lessened; the downward movement of the lower block is obtained by its upper side being formed with inclined surfaces, against which slide corresponding inclined surfaces on the horizontal bar.

The break of the engine is applied by the engine driver by any suitable arrangement.

A.D. 1872, February 8.—No. 410.

BEAR, THOMAS, of 9, Richmond Terrace, Brighton in the county of Sussex.—"The adaptation of mica "(sometimes called talc) to apparatus for saving life from fire."

I take mica (sometimes called talc) and after being laminated for the purpose I fix the said laminated mica with rivets or other suitable metal either outside or between canvas or such other material best suited for the purpose. And with that laminated mica with canvas or such other material cover the wooden or iron parts of the fire and life escape so as to afford a real protection to life from fire.

A.D. 1872, February 8.—No. 411.

BROWN, DAVID STEPHENS, of Braywick House, Green Lanes, Islington, Middlesex, gentleman.—"An "aërial machine."

The use of two aëroplanes, one placed before the other, and made double-walled to serve also as condensers.

Frame work of the machine made tubular to act also as generator or condenser. Inclining and unincling the planes at rapid intervals.

A.D. 1872, February 8.—No. 412.

COCKSHOTT, THOMAS, of Blackwall, in the county of Middlesex, chain lighterman.—"An improved "method of laying submarine telegraph cables in connection with shipping in different rivers, harbours, "and seas, and other places."

The features of novelty of this invention consist, firstly, in so connecting submarine telegraph cables with chain cables as to prevent the fouling of the telegraph cable by the swinging round of the ship to which such cable is connected. Secondly, in employing the several separate wires of the main submarine telegraph cable for transmitting messages or signals between one ship and another, or between a fleet, or between any ship and a harbour, lighthouse, or place on land instead of employing an entire main cable or several entire main cables for that purpose.

A.D. 1872, February 8.—No. 413.

YOUNG, James, of Kelly, in the county of Renfrew, North Britain.—" Improvements in the treatment of " natural petroleums."

The feature of novelty which constitutes this invention is the treatment of that class of hydrocarbon oils known as natural petroleums with muriatic acid.

A.D. 1872, February 8.—No. 414.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Edge, of Newark, in the county of Essex, and state of New Jersey, United States of America.*)—" Improvements in the manufacture of metallic knitted fabrics and chains, and in machinery " for the same."

This invention relates to the manufacture from metal wire or metal links of continuous fabrics of tubular or other form or of chains.

The principle of the invention consists in the arrangement of a reciprocating tool which expands the links or meshes that are put through the completed links of the fabric, whereby such links or meshes become part of the entire fabric or chain, and constitute loops for the reception of new links or meshes to be expanded in turn. The invention consists further in various details such as the mechanism for shaping the wire on its way to the expander, the means of imparting the necessary motions to the several devices of the machine, the arrangement of spring jaws for the reception of the expander and others.

A.D. 1872, February 9.—No. 415.

KILOH, James, of the Mill of Eden, in the county of Aberdeen, North Britain, miller. — " Improvements in manufacturing groats and in apparatus therefor."

The invention consists in subjecting the grain to percussive action between two cones having iron or steel bars on them, and the inner one of which is made to revolve at a rapid rate. The grain is fed in between the cones at their smaller ends and escapes at the wider ends with the kernel (forming the " groats ") completely separated from the husk.

A.D. 1872, February 9.—No. 416.

CRESSWELL, Alfred, of Birmingham, in the county of Warwick, builder.—" Improvements in " apparatus for straining or filtering liquids."

This invention consists of a conical frame or colander placed within the bell mouth of a funnel between which bell mouth and the apex of the conical frame a perforated collar allows the fluid to run through the tube of the funnel. Filtering paper is employed in the frame or colander.

A.D. 1872, February 9.—No. 417.

JUPP, Henry Joseph, of Thomas Street, Burdett Road, Limehouse, in the county of Middlesex, contractor. — " Improvements in apparatus for breaking or reducing bituminous rock, bones, and other " substances."

There are a drum or large roller, and two or more smaller rollers with spaces between them. One smaller roller is nearer the large roller than the other. The periphery of each roller consists of alternate circular projections and depressions. On each projecting rim are a number of curved projections terminating in a butt surface at one end and tapering to a point with bevelled sides at the other end. The projecting parts of the small rollers come opposite the sunken parts of the large roller, and vice versa.

The depressions are cleared by bars or plates. A roller is described consisting of a number of discs formed with shoulders or flanges, and having curved projections on their rims.

A.D. 1872, February 9.—No. 418.

HODGSON, Charles, of Merlin Lodge, Fulham, in the county of Middlesex, director of the Wire Tramway Company, Limited.—" Improvements in apparatus or appliances to be used in connection with wire " tramways."

This invention relates to the details of appliances for the better working of the wire tramway system, patented by Charles Hodgson, in the year 1868, and consists,—1stly. In clips for retaining the boxes upon the rope when ascending inclines. 2ndly. In gearing the pullies so that the outgoing end of the rope travels at the same speed as the incoming end. 3rdly. In hold down rails at the posts. 4thly. In hanging brackets on moveable tressels. 5thly. In cages for goods. 6thly. Double heads to posts. 7thly. Means of taking up slack rope at driving end. 8thly. Telescopic posts. 9thly. Posts upon wheels; and 10thly, conical posts of metal with ribs on the outside.

A.D. 1872, February 9.—No. 419.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Albert Gibbons Buzby, of Philadelphia, Pennsylvania, United States of America.*)—" Improvements in steam generators and in the mode of applying heat thereto."

The invention consists:—

First. In applying heat to a tubular boiler by injecting directly into the tubes hydrocarbon, hydrocarbon vapor, or inflammable gases and superheated steam.

Secondly. In the combination of detachable cylinders of refractory material with the tubes of a steam boiler, into which hydro-carbon or inflammable gases and super-heated steam is injected.

Thirdly. In the lining or partial filling of the tubes of a boiler into which hydrocarbon and super-heated steam are injected with fire clay or other refractory material.

Fourthly. In the combination with the said refractory cylinders of coils of tubing to superheat the steam employed as jets.

Fifthly. In the combination with the front ends of the steam pipes of funnel shaped plates for directing currents of air into the tubes of the boiler.

A.D. 1872, February 9.—No. 420.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from John Gravenstine, of the city of Philadelphia, and De Witt Clinton Taylor, of the city of New York, United States of America.*)—" Improvements in refrigerating apparatus."

This invention relates to an improved refrigerating apparatus consisting of a closed ice box having corrugated sides, a casing surrounding but not touching the same, and passages for the constant circulation of the enclosed air or gases. The closed ice box, which is suspended or secured within the casket or chest, is arranged for the retention of the water and ice.

A.D. 1872, February 9.—No. 421.

LAKE, William Robert, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London.—(*A communication from William Sprague, of South Kingstown, Rhode Island, United States of America.*)—" Improvements in mowing and reaping machines."

According to my present invention I use in combination with the coupling arm and finger-bar a lever and fixed ratchet. The aforesaid lever is formed with a segment piece which is grooved on its periphery and inclined towards the finger-bar, and is connected by a chain to the said bar; the driver by moving the lever can raise and lower the finger bar. I attach to the ratchet a spring bar holder to hold the said bar up. In combination with the lifting apparatus and coupling bar I use a stop which retains the coupling arm or bar in position during the raising of the finger bar. The connection between the crank and scythe which slides to and fro within the finger bar is made by a coupling rod which is connected to the crank by a universal joint. The said coupling rod is connected to the scythe by a stud without nuts or other similar contrivances which are liable to be lost. To the aforesaid coupling bar I connect a rod which extends and is connected to the pole by a bolt passed through an aperture in the said pole and through the evener. The driver's seat is placed on an arm or standard at the rear of the machine. Under the seat is a box or receptacle for tools.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 3 to August 9, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, February 10.—No. 422.

COOKE, Edmund Alleyne, of Viewville House, in the county of Edinburgh, and HENDERSON, Norman Macfarlane, of Mid Calder, in the same county, North Britain.—" Improvements in treating "hydro-carbon oils."

The feature of novelty which constitutes this invention is the filtration of the oils through sand, powdered glass, powdered pumice, or any other insoluble powder, for the removal of the acid tar contained in the oils, or the agitation of such oils with pulverised substances.

A.D. 1872, February 10.—No. 431.

HASTIE, John, of Greenock, in the county of Renfrew, North Britain, engineer.—" Improvements in "ship steering apparatus."

The apparatus comprises a horizontal screw shaft carried in bearings in a hollow pedestal, and having fast on it externally the usual steering wheel. The rudder stock has on its upper end a disc or plate, the boss of which is turned to work in a bearing formed for it in the pedestal, whereby the stock is rendered steady. The disc has a radial groove formed in its upper side, and a block or roller lying in this groove is acted upon to move the rudder by a nut or internally screwed head on the screw shaft. Instead of fixing the rudder head or disc rigidly on the rudder stock, a rosette clutch is interposed, the parts of which are kept together by rubber or other springs. When working the rudder from a bridge amidships, the screw gear is applied at the stern, and a light chain or equivalent connection is used for transmitting the force required from the bridge. In the case of a large steam ship a donkey engine is employed to force water or air into an accumulator. The water or compressed air is conveyed from the accumulator by pipes to the steering gear, and is applied to work a ram or a small engine.

A.D. 1872, February 10.—No. 433.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Emile Welter, of No. 64, Faubourg St. Martin, Paris, France.*)—" An improved "horizontal tubular boiler."

This invention relates to a boiler differing from ordinary boilers mainly in the arrangement and destination of the tubes; which from smoke tubes become boiling tubes, and which are enclosed in a casing forming fire and smoke box.

This fire and smoke box is placed within the boiler, and concentrically in every way to its sides; the water and the steam communicate front and back with the boiling tubes.

One of the advantages of this boiler is the possibility of replacing burnt or defective tubes, and removing tartar or calcareous incrustations without stopping the machine by means of conical or other digester stoppers or hollow cross-pieces placed front and back, opposite each tube.

This improved boiler is divided by means of two fire-brick partitions so as to compel the flame to hug the tubes.

A.D. 1872, February 10.—No. 434.

DOBSON, Benjamin, RUSHTON, Thomas Henry, and DOBSON, William, all of Bolton, in the county of Lancaster, machine makers.—" Improvements in machines for ginning cotton."

This invention consists in certain improvements upon the cotton gins known as the knife roller gins. The grid of the knife roller we now make of longitudinal, angle, or other shaped wire, secured at the ends and at one or more intermediate places to metal bands. The doctor knife, which is placed between and under the knife roller and gin roller, is regulated by set screws placed outside of the framing.

A.D. 1872, February 10.—No. 436.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—*(A communication from Alexandre Hédiard, of 13, Boulevart St. Martin, Paris.)*—" Improvements in the propulsion of vessels, and in apparatus for the same."

The invention consists in propelling vessels by the aid of a jet or jets of steam acting on the water contained in an open chamber, disposed below the water line at a suitable angle. The water in the chamber thus acquires a velocity which on its being projected against the surrounding water serves to propel the vessel.

A.D. 1872, February 10.—No. 437.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—*(A communication from William Condell, of the city, county and state of New York, United States of America.)*—" Improvements in apparatus for propelling vessels."

This invention consists in the application of a series of double action propelling blades, more or less in number, attached to a sliding plate actuated by means of a reciprocating rod attached thereto or connected therewith.

The propellers are attached to the sides of the vessel beneath the water line.

A.D. 1872, February 12.—No. 439.

NOTARA, Charilaos, of Number 7, Lower Castle Street, Liverpool, in the county of Lancaster, corn and grain merchant.—" A new and improved method and apparatus for separating various kinds and qualities of grain and seed, and for regulating the feed or supply of grain or seed in connection therewith."

For separating various kinds and qualities of grain and seed the inventor makes use of their different degrees of aptitude for rolling on and off from an inclined table or plane with or without such table being shaken, the most easily rolling grain being allowed to roll off the inclined table first and the rest being made to roll off in the opposite direction by reversing and increasing the inclination of the plane.

The apparatus consists of a table mounted on an axis on which it can be inclined on one side or the other. The alteration of inclination of the table and also the jolting motion being effected by suitable cams or eccentrics. On to this table the grain is allowed to fall from a hopper placed above it, the amount of the flow of grain from which is regulated by a slide acted on by a cam.

A.D. 1872, February 12.—No. 445.

WALKER, Henry, of Handsworth, in the county of Stafford, gunmaker.—" Improvements in breech loading small arms."

This invention consists principally of the following arrangements for fastening down and releasing the barrels of drop down small arms. The barrels are fastened down by an oscillating bolt, situated in a vertical recess in the break off, bearing upon the upper face of the lump on the underside of the barrels. This bolt fills up the recess, and its upper end bears upon a hemi-spherical seat at the top of the break off, a screw taking into the stem of the bolt. The bolt is capable of oscillating upon this screw and seat after the manner of a ball and socket joint. The bolt is withdrawn from the lump by means of a lever on the tang of the break off, a projecting part on the periphery of a disc on the axis of the lever, engaging in a fork or recess in an arm on the said oscillating bolt. By turning aside the lever the bolt is drawn back, and the barrels released. A spring bearing on the disc of the lever effects the return motion of the lever and the snapping action of the bolt.

A projecting finger or indicator on the screw, upon which the bolt oscillates, shows by its raised position when the barrels are not fixed down. The oscillating bolt may turn upon a centre on its underside, and be actuated by a lever connected directly to it, and the actuating levers in either arrangement may turn in a vertical plane.

Instead of suspending the bolt it may be worked by a sliding motion, a double arm spring urging forward the bolt.

An indicator is described acted upon by the bolt, the said indicator, when the barrels are unfastened projecting above the top of the break off, and when fastened, lying flush with the top of the break-off.

A.D. 1872, February 15.—No. 474.

HAMILTON, John, of Woodburn, in the county of Antrim, Ireland.—"Improvements in sewing "machines."

The feature of novelty which constitutes this invention is, the employment of a second slide attached to the lower end of the ordinary needle bar or slide so as to move the needle from side to side of the vein or hem.

A.D. 1872, February 22.—No. 574.

ROQUENCOURT, Victor Armand, of Rue de Tracy, No. 9, at Paris, manufacturer.—"An improved "apparatus for manufacturing artificial flowers."

This invention consists in moulding the chalices for artificial flowers by means of a frame consisting of two plates, the upper one of which has mandrils having the configuration of the chalices which pass through short tubes in the lower plate, which can be moved by screws to and from the upper plate.

The moulding frame is placed in a machine having a trough containing the composition for the chalices, which trough is raised by a slide, so as to cover the mandrils of the frame with composition, after which the frame is removed, the tips of the composition are taken off by a revolving cylinder; the moulder chalices are then dried on the mandrils, and the frame is again introduced into the machine where the moulded chalices are pushed off the mandrils by the action of the tubes on the lower plate of the frame, and are collected into a hopper by means of a rake.

A.D. 1872, August 3.—No. 2327.

CALAHAN, Edward Augustine, of Brooklyn, New York, United States of America, now of No. 8, Southampton Buildings, London, telegraphic engineer.—"Improvements in telegraphic printing instru-"ments, and in apparatus connected therewith."

The first part of said invention consists in a method of setting the type wheels in their correct positions, and also in connecting latches or catches so positioned and operated that the type wheel moved by the step-by-step motion keeps turning the type-wheel that would otherwise be quiescent until it is set or arrives at the zero or unison point. By this construction it becomes impossible for either type-wheel to remain out of unison while the other wheel is being operated, because a movement given to either one brings the other to its proper place and there leaves it. The second part of said invention relates to a simple and reliable switch-instrument whereby one of two or more telegraphic printing instruments may be conveniently connected with the battery and the remainder detached from the same.

A.D. 1872, August 3.—No. 2329.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from George Whitfield Tanner, of Providence, Rhode Island, United States of America.*)—"Improvements in machinery for manufacturing cigars."

This invention consists of a novel construction and arrangement of rollers for forming the fillers, and of rollers for applying the wrappers and finishing the point. A peculiar mode of mounting and operating the movable compressing roller and the movable releasing roller also of a frictional guage-rod of novel and peculiar construction.

A.D. 1872, August 6.—No. 2342.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Charles De Voy, of San Francisco, California, United States of America.*)—"An improved ink-erasing compound."

In practising my said invention I take of chloride of calcis (chloride of lime) one pound thoroughly pulverized and distilled water one gallon. The above must be thoroughly shaken when first put together and must stand twenty-four hours to dissolve the chloride of lime. I then strain through a cotton cloth, after which I add a tea spoonful of acetic acid (No. 8 of commerce) to every one ounce of the chloride calcis water. The erasing fluid is used by dipping the end of the pen into the fluid and applying it to the ink to be erased. When the ink has disappeared the fluid must be absorbed with a blotter.

A.D. 1872, August 8.—No. 2365.

HADLEY, Sidney Hopton, of Bartram Park, Hampstead, in the county of Middlesex.—(*Partly a communication from Pierre Cardailhac, of the Republic of France, engineer.*)—" Improvements in cleaning wheat " and other grain, and in apparatus employed therein."

According to this Complete Specification the grain is first passed through a rotary sieve, and it is then dropped into a tub through which a stream of water flows, the water enters at the bottom and flows out partly at the top and also partly at a side opening near the bottom. There is a vertical axis with arms revolving in the tub the chaff floats away whilst the good grain with any stones or sand escape with the water at the side opening and flow down an inclined trough. Resting on the bottom of the trough is a frame of transverse bars, and these intercept the stones and sand whilst the grain is carried over them by the stream of water. The grain then passes into a perforated casing containing parallel rotating axes with beaters.

A.D. 1872, August 9.—No. 2369.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Richards Weed, of the city and state of New York, United States of America.*)—" Improved nutritious compounds."

This invention relates to compounds of flesh and vegetables prepared by first evaporating therefrom the moisture, the ingredients being mixed together in suitable proportion with or without herbs, spices, or other condiments in such a manner that a mixture is produced which will keep for a long time and can be prepared for food in a short time and with very little labor.

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AND TO

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abr ments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belon the Abridgments in the Appendixes.]

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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to February 9, 1872, and to Appendixes from February 10 to August 9, 1872.

This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. Terms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where also single copies may be obtained at 4*d.* each, except the concluding number (containing the complete Indexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders to be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commissioners of Patents.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn.
Friday, August 16, 1872.

CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 10 to February 16, 1872.

A.D. 1872, February 10.—No. 422.

COOKE, Edmund Alleyne, of Viewville House, in the county of Edinburgh, and **HENDERSON, Norman Macfarlane**, of Mid Calder, in same county, North Britain.—"Improvements in treating hydro-carbon oils."

The feature of novelty which constitutes this invention is the filtration of the oils through sand, powdered glass, powdered pumice, or any other insoluble powder, for the removal of the acid tar contained in the oils, or the agitation of such oils with pulverised substances.

A.D. 1872, February 10.—No. 423.

MONCKTON, Edward Henry Cradock, of Pineshade, Wansford.—"Improvements in drying peat so as to render it suitable for fuel or for conversion into charcoal and other useful products, & in the apparatus for effecting the same."

1. Peat pulp is dried by means of an apparatus which acts either by simple gravitation or by exhaust, or by a combination and pressure of air from above and exhaust from below.

2. Peat partially freed from water, as above, or by any other means is still further dried by drawing or forcing air hot or cold through it.

3. Frames are introduced into the vessel containing the pulp, into which the pulp as it drains subsides, and assuming the form comes out dry or moist in the shape thus given to it.

A.D. 1872, February 10.—No. 424.

JOHNSON, John Henry, of 47, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from La Société Metallurgique pour l'exploitation des procèdès ponsard, of Paris, France.*)—"Improvements in furnaces for the treatment of zinc ores."

This invention consists essentially in the use of vertical crucibles set in a furnace and projecting through the roof, the said crucibles being charged direct from a platform by an ordinary shovel. The bottoms of the crucibles communicate with moveable extension pieces, which again open direct into descending condensing tubes, which discharge the metal into wheeled receptacles beneath. In case of vertical crucibles, horizontal retorts may be used, having vertical pipes therein for the facility of charging the same. The furnace is heated by gas obtained from a gas generator and worked in combination with a regenerator such as is described in the Specification of Letters Patent, No. 1624, A.D. 1870.

A crucible heating oven with hollow walls and closed pots for the reception of the crucibles is also combined with the zinc furnace and heated by the same flame.

A.D. 1872, February 10.—No. 425.

SMITH, Robert Fraser, of Glasgow, in the county of Lanark, North Britain.—Improvements in "obtaining yellow and red prussiates."

This invention relates to the employment of the ammoniacal liquor produced in the destructive distillation of coal shale and other similar substances as a source for the obtainment of the yellow and red prussiates, otherwise known as the ferro-cyanides and ferri-cyanides, such for example as the yellow and red prussiates of potash or other bases.

A.D. 1872, February 10.—No. 426.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from La Société Metallurgique pour l'exploitation des procèdès ponsard, of Paris, France.*)—"Improvements in the treatment of zinc ores and other volatile metals, and in apparatus employed "therein."

The essential features of this invention are the charging and discharging the ores of zinc, and other volatile metals onto and from the inclined sole or hearth of a reverberatory furnace, where they are subjected to the action of an essentially reducing flame, and elevated to a sufficient temperature to produce the distillation of the metal. The metallic vapours pass off directly from the upper end or mouth of the inclined furnace into a condenser, so constructed that the carbonic oxyde gas from the furnace, more or less mixed with carbonic acid, but still combustible, may be cooled therein, and be thence directed to a furnace, where it is burnt for the purpose of heating the regenerator, which supplys the metal furnace with the hot air necessary for the combustion of the gas from the gas generator.

A.D. 1872, February 10.—No. 427.

FRANCES, Charles, of Manchester, in the county of Lancaster, builder.—"Improvements applicable to "privies, and the ash pits connected therewith."

This invention consists in an arrangement, whereby the coarse and fine particles of waste matter are separated, the latter only passing to the privy, and in a method of removing the same.

A.D. 1872, February 10.—No. 428.

BOTTOMLEY, Henry, of Low Moor, near Bradford, in the county of York.—"Improvements in means "or apparatus employed in doubling worsted, and other yarns."

The object of the invention is to obtain a draft in the yarn, between the feed bobbins or spools, or other holders, and the delivery rollers for delivering the yarn to the spindle to be doubled. To effect this, there is applied between such feed bobbins or other holders, other extra rollers, between which the yarn is nipped, and by which its speed is regulated in its passage to the delivery rollers. The speed of these extra rollers, in relation to that of the delivery rollers will vary, but the object is simply to produce, by a slight drag, a tension that will prevent slack in the passage of the yarn to the delivery rollers, and will thereby ensure more even yarn in the doubling.

A.D. 1872, February 10.—No. 429.

IRELAND, William, of Macclesfield, in the county of Chester, and **IRELAND, Jonathan**, the younger, of Manchester, in the county of Lancaster.—(*A communication from Richard Pink, of Hoerde, Westphalia.*)—"Improvements in the manufacture of cast or Bessemer steel ingots."

This invention consists, first, in improved apparatus for producing steel or other ingots of a dimension suitable for direct rolling, without previously forging or cogging down the same, and thereby enabling the railway rail or other bar to be finished from the rolls in one heat.

Secondly. In the use of burnt channelled fire bricks inserted in recesses in a cast iron bottom plate planed on its upper surface.

Thirdly. In the use of an iron git lined up with loam on its inner surface for the purpose of conducting the molten metal to the channelled bricks in the bottom plate, and

Fourthly. In the use of parallel moulds for receiving the molten steel or iron, the said moulds being planed on the whole of their inner surface.

A.D. 1872, February 10.—No. 430.

WOODS, John Edward, of 44, Finsbury Circus, in the city of London, engineer.—"Improvements in "railway carriages."

Introducing bands or pads of vulcanized india rubber to the springs and door pillars of railway carriages, to lessen the vibration and shocks.

A.D. 1872, February 10.—No. 431.

HASTIE, John, of Greenock, in the county of Renfrew, North Britain, engineer.—"Improvements in "ship steering apparatus."

The apparatus comprises a horizontal screw shaft carried in bearings in a hollow pedestal, and having fast on it externally the usual steering wheel. The rudder stock has on its upper end a disc or plate, the boss of which is turned to work in a bearing formed for it in the pedestal, whereby the stock is rendered steady. The disc has a radial groove formed in its upper side, and a block or roller lying in this groove is acted upon to move the rudder by a nut or internally screwed head on the screw shaft. Instead of fixing the rudder head or disc rigidly on the rudder stock, a rosette clutch is interposed, the parts of which are kept together by rubber or other springs. When working the rudder from a bridge amidships, the screw gear is applied at the stern, and a light chain or equivalent connection is used for transmitting the force required from the bridge. In the case of a large steam ship a donkey engine is employed to force water or air into an accumulator. The water or compressed air is conveyed from the accumulator by pipes to the steering gear, and is applied to work a ram or a small engine.

A.D. 1872, February 10.—No. 432.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from George Bailey Brayton, of Boston, Massachusetts, United States of America.*)—"Improvements in gas-engines."

This invention relates to improvements in engines which employ an explosive mixture of air and gas for the motive force. A limited quantity of the explosive mixture is held in reserve under the pressure of several atmospheres in a reservoir in connection with the engine. By a suitable arrangement of valves and valve gearing a charge of the mixture so under pressure is admitted into a chamber immediately connected with the cylinder, and forced through the meshes of a series of wire gauze diaphragms extending across such chamber. A lambent flame is kept burning upon the surface of the gauze diaphragms by means of a constant but limited supply of gas, and this acts as a torch to ignite the successive charges as they are entering the cylinder. The gauze diaphragms also serve to prevent the return of the flame. By this arrangement the gaseous mixture is made to exert not a spasmodic or explosive force upon the piston, but a true pressure due to expansion.

A.D. 1872, February 10.—No. 433.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Emile Welter, of No. 64, Faubourg St. Martin, Paris, France.*)—"An improved "horizontal tubular boiler."

This invention relates to a boiler differing from ordinary boilers mainly in the arrangement and destination of the tubes; which from smoke tubes become boiling tubes, and which are enclosed in a casing forming fire and smoke box.

This fire and smoke box is placed within the boiler, and concentrically in every way to its sides; the water and the steam communicate front and back with the boiling tubes.

One of the advantages of this boiler is the possibility of replacing burnt or defective tubes, and removing tartar or calcareous incrustations without stopping the machine by means of conical or other digester stoppers or hollow cross-pieces placed front and back, opposite each tube.

This improved boiler is divided by means of two fire-brick partitions so as to compel the flame to hug the tubes.

A.D. 1872, February 10.—No. 434.

DOBSON, Benjamin, RUSHTON, Thomas Henry, and DOBSON, William, all of Bolton, in the county of Lancaster, machine makers.—"Improvements in machines for ginning cotton."

This invention consists in certain improvements upon the cotton gins known as the knife roller gins. The grid of the knife roller we now make of longitudinal, angle, or other shaped wire, secured at the ends and at one or more intermediate places to metal bands. The doctor knife, which is placed between and under the knife roller and gin roller, is regulated by set screws placed outside of the framing.

A.D. 1872, February 10.—No. 435.

ROBEY, James, of the city of Manchester, sugar refiner.—"A new or improved substitute for animal "charcoal."

The features of novelty in this invention consist in mixing clay and peat intimately together in certain proportions, and burning the mixture in close vessels to produce a substance capable of being used for disinfecting, filtering sewages, decolouring sugar liquids and other analogous purposes for which animal charcoal has hitherto been employed.

A.D. 1872, February 10.—No. 436.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Alexandre Hédiard, of 13, Boulevart St. Martin, Paris.*)—" Improvements in the pro-" pulsion of vessels, and in apparatus for the same."

The invention consists in propelling vessels by the aid of a jet or jets of steam acting on the water contained in an open chamber, disposed below the water line at a suitable angle. The water in the chamber thus acquires a velocity, which on its being projected against the surrounding water serves to propel the vessel.

A.D. 1872, February 10.—No. 437.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Condell, of the city, county and state of New York, United States of America.*)—" Improvements in apparatus for propelling vessels."

This invention consists in the application of a series of double action propelling blades, more or less in number, attached to a sliding plate actuated by means of a reciprocating rod attached thereto or connected therewith.

The propellers are attached to the sides of the vessel beneath the water line.

A.D. 1872, February 12.—No. 438.

GREENER, John Henry, of Lombard Street, in the city of London, civil engineer, and **SARNEY, Thomas Sexton**, of Brixton, in the county of Surrey, mechanical engineer.—" Improvements in fastenings " for permanent way of railways."

This invention consists in fastening or securing keys, chairs, and rails to railway sleepers, by means of spikes or trenails, screws or bolts, which are passed through the same respectively.

A.D. 1872, February 12.—No. 439.

NOTARA, Charilaos, of Number 7, Lower Castle Street, Liverpool, in the county of Lancaster, corn and grain merchant.—" A new and improved method and apparatus for separating various kinds and qualities " of grain and seed, and for regulating the feed or supply of grain or seed in connection therewith."

For separating various kinds and qualities of grain and seed the inventor makes use of their different degrees of aptitude for rolling on and off from an inclined table or plane with or without such table being shaken, the most easily rolling grain being allowed to roll off the inclined table first and the rest being made to roll off in the opposite direction by reversing and increasing the inclination of the plane.

The apparatus consists of a table mounted on an axis, on which it can be inclined on one side or the other. The alteration of inclination of the table and also the jolting motion being effected by suitable cams or eccentrics. On to this table the grain is allowed to fall from a hopper placed above it, the amount of the flow of grain from which is regulated by a slide acted on by a cam.

A.D. 1872, February 12.—No. 440.

BURN, Robert, junior, of Epsom, in the county of Surrey, engineer.—" Improved apparatus for signalling " on railways."

This invention consists of the arrangement of signalling apparatus placed on the engine or at any other desired part of a train, and which is set in operation by a double-action trigger, the latter being actuated by a sliding or adjustable bar which moves simultaneously with the ordinary signal arm or by a screw clip placed on the rail.

A.D. 1872, February 12.—No. 441.

BARRACLOUGH, Arthur, of Boys Mills, Halifax, in the county of York, woollen manufacturer, and **BARRACLOUGH, Thomas Critchley**, of Manchester, in the county of Lancaster, engineer.—" Improvements in apparatus for damping, stiffening, oiling, and coloring fabrics, and damping, oiling, and " coloring fibrous materials, yarns, and paper."

This invention consists in further improvements upon the invention secured to the within named Arthur Barraclough by former Letters Patent, bearing date the 24th day of February, 1871, No. 495. Our present invention consists in so constructing the nozzles for the air, and for the damping, stiffening, oiling, and colouring liquids, that a single pair of nozzles will effect the object hitherto requiring a series of nozzles.

A.D. 1872, February 12.—No. 442.

SMITH, Thomas James, of the firm of Robertson, Brooman, and Company, of 166, Fleet Street, in the city of London, patent agents.—(*A communication from the Company or Society Jean Baptiste Marée and Varlet, manufacturers, of Remilly* (*Ardennes.*))—" Improved means of and apparatus for dividing the fleece in " carding engines."

This relates to apparatus for dividing the fleece or bat proceeding from the carding engine into ribbons of a convenient width. The apparatus principally consists of two parallel shafts, revolving in opposite directions. Upon these are fixed alternately rollers of two different sizes. The larger of these rollers are grooved on their side faces, while the sides of the smaller rollers are made convex. Circular blades or discs are fixed at the sides of the rollers, and the discs on the opposite shafts meet and overlap one another at about the peripheries of the large rollers.

The groovings on the large rollers cause their discs to contract inwards, while the convexity of the small rollers forces their discs outwards, so that the opposite discs overlap and cut the fleece as it passes over them like shears.

A.D. 1872, February 12.—No. 443.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Robert A. McLeod, of Florence, Italy.*)—" An improved method of uniting " and securing beams or pieces of wood or metal in the construction of bridges, and for other like purposes."

I employ beams of wood, iron, or other metal or material, each of which beams is supported by resting at or near each end upon another beam, and in its turn supports one or more other beams, which rest upon it. The several beams which meet together thus form and are sustained by self-supporting joints. The said beams are fitted together by notches and tongues whose shape and dimensions are determined by the nature of the structure.

A.D. 1872, February 12.—No. 444.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Henry Wardwell Shepard, and Robert Seaman, both of the city and state of New York, United States of America.*)—" Improvements in metallic cans and similar vessels, and in locking " devices therefor."

The chief object of the present invention is to furnish a cheap, strong, and durable can, one in the manufacture of which all seam joints on the inner surface of the can are dispensed with, and the independent outer hoops, heretofore invariably used to strengthen and brace the cylinder at its point of attachment with the breast and bottom, are rendered entirely unnecessary. I stamp or otherwise form of a single piece of any plate of sheet metal, both the bottom and breast; the former consisting of a convex plate with a hoop, and the latter of the ordinary arched plate with a vertical collar and a vertical hoop extending down from the base of its arch. Instead of stamping the bottom out of very heavy metal, a most desirable article of manufacture may be produced by using a thin metallic plate, and so stamping it as to leave the convex plate and vertical hoop, and by securing on its rim three or more elbow-shaped brace rests or supports. These rests brace the bottom and hoop, and protect and strengthen the annular rim. The said invention also relates to an improved locking device. On the outer face of the neck is secured a lock, arranged in such a position on the neck, that when the cover is inserted and so turned that hooks thereon butt against shoulders, an opening in the lock through which the bolt is thrown out will be immediately at the outer surface of the bolt. Therefore when the key is inserted and the bolt thrown out the hooks will be securely fastened.

A.D. 1872, February 12.—No. 445.

WALKER, Henry, of Handsworth, in the county of Stafford, gunmaker.—" Improvements in breech " loading small arms."

This invention consists principally of the following arrangements for fastening down and releasing the barrels of drop down small arms. The barrels are fastened down by an oscillating bolt, situated in a vertical recess in the break off, bearing upon the upper face of the lump on the underside of the barrels. This bolt fills up the recess, and its upper end bears upon a hemispherical seat at the top of the break off, a screw taking into the stem of the bolt. The bolt is capable of oscillating upon this screw and seat after the manner of a ball and socket joint. The bolt is withdrawn from the lump by means of a lever on the tang of the break off, a projecting part on the periphery of a disc on the axis of the lever, engaging in a fork or recess in an arm on the said oscillating bolt. By turning aside the lever the bolt is drawn back, and the barrels released. A spring bearing on the disc of the lever effects the return motion of the lever and the snapping action of the bolt.

A projecting finger or indicator on the screw, upon which the bolt oscillates, shows by its raised position when the barrels are not fixed down. The oscillating bolt may turn upon a centre on its underside, and be actuated by a lever connected directly to it, and the actuating levers in either arrangement may turn in a vertical plane.

Instead of suspending the bolt it may be worked by a sliding motion, a double arm spring urging forward the bolt.

An indicator is described acted upon by the bolt, the said indicator, when the barrels are unfastened, projecting above the top of the break off, and when fastened, lying flush with the top of the break-off.

A.D. 1872, February 12.—No. 446.

WILSON, Thomas McMicking, of Bergen, in the Kingdom of Norway, but at present residing at Arundel Hotel, Arundel Street, in the city of Westminster, engineer.—"Improvements in the mode of and "apparatus for refining or purifying oils."

The object of this invention is the refining or purifying of oils, so as to render them, when thick and opaque owing to the pressure of solid matters, such as spermaceti, stearine, and margarin, fluid and clear. These solid matters are crystallizable, and it is the crystallization, in a manner that will allow of their separation from the oil by filtration, on which my invention is based.

A.D. 1872, February 13.—No. 447.

HODGSON, James Adshead, of Blyth, in the county of Northumberland, master mariner.—"Improved "apparatus or gear for driving a screw propeller when the engines are broken down at sea."

There is a sheave on the screw propeller shaft; there are other sheaves on deck and a sheave on the steam winch; chains pass round these sheaves. Thus in case of the engines breaking down the propeller may be driven from the steam winch.

A.D. 1872, February 13.—No. 448.

FULDA, Silvester, of Bow, London, in the county of Middlesex.—"Improvements in the treating of "impure or discoloured waters for the purpose of clarifying the same, and in the employment of the refuse "for agricultural purposes."

The impure water is conveyed into a tank; unslacked lime (1 cwt.) and sulphate of soda (1 pound) mixed together with water is put into the water; of this mixture about two gallons are used to about two hundred gallons of water, which precipitates the colouring or impure matter to the bottom of the tank; the pure water is then run off and the sediment used as manure.

A.D. 1872, February 13.—No. 449.

STOTT, Henry, of Greetland, near Halifax, in the county of York, cotton warp maker.—"Improvements "in ventilating sewers and drains."

This invention consists in connecting sewers and drains by pipes with the furnaces of steam boilers or other furnaces where there is a strong draught or high chimney. For this purpose I enclose the ashes place by a door and introduce or connect the pipe from the sewer or drain to the ashes place in any convenient manner. In some cases or places I may dispense with the sewer or drain traps for the purpose of admitting a sufficient supply of air.

A.D. 1872, February 13.—No. 450.

HUNT, Bristow, of No. 1, Serle Street, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from Augustus Lawrence McCrea, of Washington, district of Columbia, in the United States of America.*)—"Improvements in postal cards and in covers therefor."

This invention consists of a sheet of paper or other material adapted for ready application to and combined with a card, which may be of thicker or stiffer material, so as to cover and protect the writing thereon, the two together forming a card envelope as a substitute for the ordinary postal card.

A.D. 1872, February 13.—No. 451.

POCOCK, Alfred Wilmer, of Pimlico, in the county of Middlesex, engineer.—" Improvements in the " construction of fasteners for window sashes."

This relates to the construction of sash fasteners in which a bolt is employed for entering into a box or chamber fitted upon one sash, and of a barrel in which the bolt is free to turn when acted upon by a lever, the barrel being upon the other sash.

A.D. 1872, February 13.—No. 452.

ALLINGHAM, John James, of 68, Hamilton Road, Everton, Liverpool, in the county of Lancaster.— " Improved means of and apparatus for moving vessels through the water."

Self adjusting louvre boards or flaps are arranged in frames depending from a vessel. The blades open and close alternately, as the vessel rises and falls under the action of the waves or the wind, and so produce a propulsion.

A.D. 1872, February 13.—No. 453.

DEANS, Peter Dods, of Leith, in the county of Edinburgh, merchant, and **MacNAUGHTON, Daniel**, of Leith aforesaid, merchant, both partners of the firm of MacLean & Hope, merchants in Leith aforesaid. —" Improvements in the production of sulphate of ammonia."

According to this Provisional Specification sulpho-cyanide of ammonia is mixed with lime, put into a retort, and distilled. The ammonia vapour is mixed with steam and collected in sulphuric acid. The liquor is heated by a steam coil and evaporated. The sulphate of ammonia is raked out and dried.

A.D. 1872, February 13.—No. 454.

WARLICH, Ferdinand Henry, of No. 1, Hebron Terrace, Grove Lane, Camberwell, in the county of Surrey.—" Improvements in the manufacture of artificial fuel and in apparatus to be used for this purpose."

This Provisional Specification describes a process and apparatus for converting all kinds of inferior coals, comparatively useless by reason of their being mixed with stones, dirt, pyrites, and other impurities, also the small or slack, into a fuel equal to and superior to that of the best coals and hitherto manufactured artificial fuels.

A.D. 1872, February 13.—No. 455.

NICHOL, John Davidson, printer, and **ECKERSLEY, James**, engineer, both of Edinburgh, in the Kingdom of Scotland.—" Improvements in apparatus for drying and pressing or callendering printed " paper."

This invention relates to various improvements upon an invention for which we obtained Letters Patent, dated February 18th, 1869, No. 496, and consists in improvements upon the pressing or callendering part of the apparatus, and in an improved mode of combining and arranging the drying apparatus with the pressing or callendering rollers.

A.D. 1872, February 13.—No. 456.

RICHARDSON, William, of Oldham, in the county of Lancaster, mechanical engineer.—" Improvements " in machinery for burring and cleaning or opening wool, cotton, and other fibrous materials."

This invention relates, firstly, to a transferring apparatus for machines in which " fine comb " cylinders are employed; secondly, in the same machines making a lap by streams of air.

A.D. 1872, February 13.—No. 457.

SETCHELL, Oliver Cromwell, of Albany Road, Camberwell, in the county of Surrey, gentleman.— " Improvements in treating or preparing certain waste substances, so as to render them useful as " compositions for lighting fires."

This composition for lighting fires is formed mainly of saw-dust or comminuted wood, such as turnings or fine shavings, which by means of heat and pressure may be consolidated into bricks or blocks of any convenient shape and dimensions suitable for igniting the coal or cinders laid thereon to make a fire.

A.D. 1872, February 14.—No. 458.

COTTAM, Edward, of Wimbledon, in the county of Surrey.—"Improvements in the construction of "buildings for the safe keeping of deeds and other securities or valuable property."

This invention relates to buildings intended to contain numerous safes for the keeping of deeds, records, securities, and other valuable property. These buildings require to be of great strength, and the object of the invention is to utilize the space occupied by the supporting columns and girders, which space has not hitherto been utilized and to effect economy in the combined cost of the buildings and safes.

According to this invention the supports for the several floors consist of superposed safes, instead of being ordinary columns, and the girders are made cellular, each cell forming a safe.

A.D. 1872, February 14.—No. 459.

YOUNG, James, of Kelly, in the county of Renfrew, North Britain—"Improvements in treating hydrocarbons."

The feature of novelty which constitutes this invention is the treatment of that class of hydrocarbons known as natural bitumens with muriatic acid in the gaseous state.

A.D. 1872, February 14.—No. 460.

MARSH, Charles William Earle, of Laurence Pountney Lane, in the city of London, civil engineer.—"Improvements in apparatus for communicating between the passengers and guard, or between the guards "and drivers of railway trains."

This invention has for its object improvements in apparatus for communicating signals between the passengers and guards and engine drivers of railway trains.

For this purpose a light rod or tube is arranged the length of each carriage in bearings, so as to revolve freely. At the ends of each of these rods, joints are formed and connected with apparatus, so arranged as to allow of free motion for the vertical, horizontal, and lateral movements of the carriages when coupled together.

When an alarm is to be given from one of the compartments of a train, the passenger pulls down a lever, which being attached by a wire and crank to the main bar or rod, gives about a quarter of a turn to the whole length up to the guard's van, in which is placed a bell crank, with wires running up to an alarm bell, which is thus set in motion, and at the same time a small signal or indicator is thrown out, thus showing the compartment where the alarm originated. The main rod immediately revolves back into its place, ready for further communication, by the weight of the cranks and a balance arranged for that purpose, which is placed in the guard's compartment. This guard is now left to continue the alarm to the others or the driver, if found necessary.

A.D. 1872, February 14.—No. 461.

BLUNDON, Edward Henry, and CLEAVER, Samuel Tarlton, both of Canonbury Road, Islington, in the county of Middlesex.—"Improvements in the construction of cocks or taps."

This invention relates to improvements in the construction of cocks or taps for drawing off liquids, and has for its object the prevention of leakage through the outlet orifice and key-way or plug, the outlet orifice being closed by a conical valve.

A.D. 1872, February 14.—No. 462.

MARSH, Charles William Earle, of Laurence Pountney Lane, in the city of London, civil engineer.—"Improvements in meters or apparatus for measuring water or other liquids."

This invention has for its object the arrangement and construction of self-acting apparatus for accurately measuring water or other liquids when flowing at various velocities, or so as to be capable of measuring and registering irregular streams or otherwise.

According to this invention a self-acting tilting bucket or vessel is employed, constructed with two compartments or chambers, and arranged so as to tilt or turn over and empty themselves alternately, by means of floats and weight of liquid when the desired quantity is received into one of its compartments, and when one compartment is being discharged the other is placed in position ready to receive the flow of liquid.

Each of the measuring compartments is fitted with a float and catch, and as one of the compartments fills with liquid the float rises, and when full it liberates the catch, and the measuring vessel immediately balances over, thus emptying itself and bringing the other part of the vessel into an upright position under the flow of liquid, where it locks itself until acted upon by the float and fluid in the manner previously described.

Any suitable registering apparatus is connected with the measuring vessel to indicate the number of movements thereof.

A.D. 1872, February 14.—No. 463.

ROECKNER, Carl Heinrich, of 11, North Carolina Terrace, Newcastle on Tyne, papermaker, and **LUNGE, George**, of South Shields, in the county of Durham, chemical manufacturer.—" Improvements " in boilers for papermakers and others."

This invention consists in combining a separate heating apparatus in connection with a main boiler, by which the latter is heated, and causing the liquid employed in the operation of boiling to circulate through the whole apparatus.

A.D. 1872, February 14.—No. 464.

BARLOW, Henry Bernoulli, of Manchester, in the county of Lancaster, patent agent.—(*A communication from Charles Emile Rousseau, junior, and Ferdinand Cochard, both of Paris, France.*)—" Improvements " in preserving animal and vegetable substances."

This invention consists in the use of the soluble salts of lime or lime water for preserving animal and vegetable substances. The two salts used by preference are the acetate and bi-carbonate of lime, but the bisulphate or other salts or lime water may be used. The substances to be preserved are steeped for about 12 hours in a solution of acetate or other salt of lime or in lime water, and then taken out and dried or partially dried.

A.D. 1872, February 14.—No. 465.

CARTER, David, of 86, Islingword Road, Brighton, in the county of Sussex.—" Improvements in what " are known as 'dry earth' closets."

In dry closets constructed according to this invention, in place of the supply of dry earth or other dry deodorizing material being contained in a hopper, and delivered in measured quantities to the closet each time it is used as heretofore usual, the supply of earth or material is placed into the receiver itself in which the excreta is collected. The receiver is mounted on pins or axes, and receives a partial turn each time the lid is opened or closed.

A.D. 1872, February 14.—No. 466.

PRINTZ, Georg, of Aix la Chapelle, in the Kingdom of Prussia.—(*A communication from Francis Kayser, a person resident at Iserlohn, in the Kingdom of Prussia.*)—" Improvements in machinery for stamping needles."

This Provisional Specification describes a machine for stamping needles automatically.

The needles to be stamped are put in a funnel, from whence they are delivered one by one by the turning of a channelled roller, and fall on to a fork against a matrix. A stamp is moved forward against the matrix, and after having stamped the needle it is moved back by a cam. A hook then removes the needle which has been stamped.

A.D. 1872, February 14.—No. 467.

COLBORNE, John, of Grafton Club, Grafton Street, in the county of Middlesex, Captain in H.M. 11th Regt. of Foot, honble.—" An improved apparatus for facilitating the teaching of military drill."

This invention consists in teaching military drill by the employment of a lilliputian regiment and miniature field contained within suitable apparatus.

A.D. 1872, February 14.—No. 468.

BEAR, Thomas, of No. 9, Richmond Terrace, Brighton, in the county of Sussex, gentleman.—" The " adaptation of mica or talc to water gauges to steam and other boilers."

I take mica or talc and laminate same of a substance best suited: the mica so laminated I place on the outside or inside of a metal framework properly secured and rendered steam and water tight, the whole forming when finished an elongated or other shaped box or tube open at each end to allow free ingress or egress of water and steam; the mica being transparent, the rise and fall of the water in the boiler can be clearly distinguished, & thereby forming an indestructable gauge.

A.D. 1872, February 14.—No. 469.

SMITH, Thomas James, of the firm of Robertson, Brooman, and Company, of 166, Fleet Street, in the city of London, patent agents.—(*A communication from Joseph Porter Michaels and Lewis Wells Broadwell, both residing at Vienna, in the Empire of Austria.*)—" Improvements in apparatus for retarding and stopping " railway trains."

This consists in attaching levers or rods in connection with the break blocks to the draw bars, so that as the engine exerts its power in pulling, the breaks are prevented from contact with the wheels, but on the steam being shut off the impetus of the rear portion of the train causes the compression of the buffers, and the inner ends of their rods bear against sliding bars acting upon levers which put the breaks into action upon the wheels; alternative methods are also described.

A.D. 1872, February 14.—No. 470.

CARR, Martin, junior, of Middlesborough, in the county of York, architect.—" Improvements in dry earth " closets."

This consists principally in the employment of a revolving or rotating cylinder or box in a chamber at the back or the side of the closet, which cylinder or box is partly solid and partly open, the open part having bars or perforated gauze through which the ashes or other materials can pass from the inside when a rotation is given to it by a handle, either from the outside or from the inside of the closet.

A.D. 1872, February 14.—No. 471.

WALCH, Ottmar, of Rue du Faubourg St. Martin, No. 212, à Paris, engineer.—" Improved apparatus " to be used in the manufacture of matches."

This consists in, 1st., arranging on the lower part of the machine two stationary receptacles containing matches to be phosphorized surmounted by oscillating hoppers or slides divided into compartments formed by a table having two series of grooves; 2ndly, fitting moveable bottoms or pistons to the receptacles, the pistons being impelled by springs in order to push the matches upwards and causes them to lodge in the grooves, an action facilitated by the to and fro motion of the hoppers.

3rdly, the arrangement of a governing lever which causes the movement of the table and which produces the oscillation or to and fro motion of the distributing hopper; and, 4thly, the general combination and arrangement of the machine which realizes for the first time the mechanical distribution of the plates and matches.

A.D. 1872, February 14.—No. 472.

JOHNSON, Thomas, of Plumstead, in the county of Kent.—" Improvements in valves for sewers or drains " for preventing or arresting the passage of noxious or offensive gases."

To prevent the passage of noxious gases from the main sewer up into the branch sewers or drains and from thence into the houses or buildings which discharge their sewage into the drains, I adapt to the main sewer in the vicinity of the discharge end of the branch sewer or house drain a self acting float valve.

A.D. 1872, February 15.—No. 473.

WHEATSTONE, Sir Charles, of 19, Park Crescent, Regent's Park, Knight, and **STROH**, John Matthias Augustus, of 29, Tolmer's Square, Hampstead Road, mechanician, both in the county of Middlesex.—" Improvements in electro-magnetic telegraphs and in apparatus connected therewith, parts of " which improvements are applicable to other purposes."

The invention relates, firstly, to means by which the motion of a hand, dial, or type-wheel of an electro-magnetic telegraph is rendered independent of the step by step movement of the propelment actuated by the successive currents transmitted through the line, so that the hand, dial, or type wheel started by the first current moves continuously until it is arrested by a stop brought to the resting position by the step by step movement.

Secondly. To means by which the hammer which strikes the paper against the type wheel is caused to act immediately after the cessation of the series of currents necessary to bring the type wheel to the required position.

Thirdly. To a method of inking the type wheel by which a revolving arm moving through a reservoir of fluid ink periodically supplies the ink to a revolving brush pressing against and moving with the type wheel.

Fourthly. To means of transferring currents from one line to another by means of finger keys, the elevation of the last used finger key being effected by pressing any other by its action on a chain.

Fifthly. To the construction of two magneto-electric machines for ringing magneto-electric bells.

A.D. 1872, February 15.—No. 474.

HAMILTON, John, of Woodburn, in the county of Antrim, Ireland.—"Improvements in sewing "machines."

The feature of novelty which constitutes this invention is the employment of a second slide attached to the lower end of the ordinary needle bar or slide, so as to move the needle from side to side of the vein or hem.

A.D. 1872, February 15.—No. 475.

EDWARDS, Robert, and ROBINSON, Thomas, both of Sheffield, in the county of York—"Improvements in the construction of furnaces for heating, puddling, or melting iron, steel, or other metals."

This improved furnace consists of two heating portions, each portion having a grate and firing opening or door and the usual door or doors for the purpose of charging and discharging. The flame, heat, and smoke pass from each end over suitable bridges, varying as in ordinary furnaces according to the materials in the course of being heated, & meet in a central flue. Between each part of the double furnace we have a cast iron girder with supporting brackets for carrying the roof at the junction of the furnace and flue. This flue is the special feature of our improved furnace, and can be taken either upwards or downwards or otherwise as may be required or convenient, and either way the flame and consumed smoke may be utilized by letting it pass through the flue or flues of steam boilers.

A.D. 1872, February 15.—No. 476.

ROWAN, Thomas, of Glasgow, in the county of Lanark, North Britain, manufacturing chemist.—"Improvements in preparing carbonates or oxides of lead and zinc for use as pigments and otherwise."

One improvement consists in mixing a soluble salt of lead or of zinc with an alkaline carbonate in water under pressure and aided by heat, the pressure and corresponding temperature being increased in each case until double decomposition takes place.

The salt of lead or zinc may be obtained directly from ores of the metal by treating such ores in a crushed or pulverised state with a suitable acid.

If zinc oxide is required to be used as a white pigment or otherwise, it is obtainable from the carbonate by heating the latter to drive off the carbonic acid.

The lead carbonate may be more or less heated and with or without access of air, whereby it will be more or less completely converted into oxide and assume more or less of a yellow or red color.

A.D. 1872, February 15.—No. 477.

SMITH, Thomas James, of the firm of Robertson, Brooman, and Company, of 166, Fleet Street, in the city of London, patent agents.—(*A communication from Joseph Porter Michaels and Lewis Wells Broadwell, both residing at Vienna, in the Empire of Austria.*)—"Improved means of and apparatus for communicating "between railway carriages and for ventilating the same."

This consists chiefly in fixing one or more tubes along the upper part of each carriage, so that a cry could be heard through the train. Near the roof of each carriage the tubes have bell or conical shaped openings, through which the sounds pass, each bell or cone being partially closed by a flap valve. The outside ends of the tubes have conical mouth pieces of flexible material, so as to establish communication from carriage to carriage. Telegraph wires may be laid in the tube.

A.D. 1872, February 15.—No. 478.

SWINDELLS, Rupert, and WORMALD, John, of Manchester, in the county of Lancaster.—" Improvements in spanners."

This invention relates to that class of spanners of which each is made of one piece of metal having a recess in one or both ends to turn the heads of screws and nuts, and consists in forming in the ends of the spanners rectangular or other shaped surfaces, so that they can be adapted to heads and nuts of different sizes, instead of each end being employed for only one size, as at present.

A.D. 1872, February 15.—No. 479.

LOCK, John Henry, of Kensington, in the county of Middlesex.—" Apparatus or means of indicating the name of the station or the names of the stations to which a railway train is proceeding, and the name of the station at which the train successively stops."

This invention has for its object the arrangement and application of apparatus to railway carriages for the purpose of indicating to the passengers the name of the station or the names of the stations to which the train is proceeding and the name of the particular station at which the train successively stops, whilst it is stopping there.

For this purpose each carriage of a train has a rod or shaft extending from end to end. This rod or shaft is mounted so as to revolve in suitable bearings, being connected with the rod or shaft of the carriage next to it at either or both ends by means of a self adjusting coupling, which will transmit rotary motion from one shaft to another from one end of the train of carriages to the other, independently of the relative positions the carriages may assume in passing around curves or from vibration or otherwise.

The rods or shafts of each carriage when coupled together are made continuous throughout the train, rotary motion being imparted thereto from time to time by suitable gearing driven by a winch handle, wheel, or otherwise, under the control of the guard or other person appointed to work the apparatus.

Drums or rollers are mounted upon axes, and such rollers carry travelling endless bands, upon which the names of the successive stations are indicated in bold characters. The axes of the rollers are actuated by bevil or other suitable gearing connecting them with the driving rod or shaft previously described, so that the name of each successive station, as it is approached or arrived at by the train, may be brought prominently into view within each compartment of the carriages of the train.

The apparatus may also be so arranged as to strike a gong or give some other suitable signal to the passengers when a change is to take place in the indicator.

If desired the apparatus may be rendered self acting.

A.D. 1872, February 15.—No. 480.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Hainsworth, of Pittsburgh, Pennsylvania, in the United States of America.*)—" Improvements in moulds and cores, and in mould and core linings and facings for metal castings, and in materials employed therefor."

This invention consists in using pulverized coke mixed with sour beer, fire clay water, molasses, or other similar fluid as a material for forming moulds and cores for metal castings or as a lining for such moulds and cores.

A.D. 1872, February 15.—No. 481.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Lewis Miller, of Akron, Ohio, United States of America.*)—" Improvements in harvesting machines."

This invention relates more particularly to the construction and operation of a rake and its mechanism, located and actuated on the platform or grain table of the machine, and so as to sweep the grain first from the main frame towards the grain side of the platform and thence around to a delivery point towards the rear of the platform and on that side of it next the main frame. And the said invention further relates to the construction and operation of a driver's seat arranged on the main frame and supported and made adjustable.

A.D. 1872, February 15.—No. 482.

TRUMAN, Edwin Thomas, of Old Burlington Street, in the county of Middlesex.—" Improvements in covering wire or other suitable conductors with insulating materials, and in machinery employed in the covering process."

According to this invention the wire is covered with gutta percha or other insulating material in a solid homogeneous layer concentrically with the wire, the layer being applied of any requisite thickness, so as to cover an ordinary telegraph wire or strand, and enable a sufficient body of insulating material to be applied to it in one covering operation, thereby dispensing with the necessity of repeating successive covering operations and of using adhesive cementing materials.

The machinery employed in the covering process is so arranged that the wire is made to travel in a straight line from point of entrance to point of exit, and to rotate at the same time round its line of travel, while the requisite portion of insulating material is placed around it and so forms a homogeneous insulating coat of sufficient thickness, the insulating coat being circumferentially and evenly pressed upon the wire while it is rotating inside a glass or glazed tube, and being kept under control until the insulating coat is set and cooled, and the covering is thus completed at one operation. The concentricity of the wire relatively to its insulating coat is secured by causing the wire while being held sufficiently tightly to be in a straight line to rotate with its applied covering inside the said tube.

A.D. 1872, February 15.—No. 483.

HARFIELD, William Horatio, of No. 28, Cornhill, in the city of London.—"Improvements in "windlasses and chain controllers."

This Provisional Specification describes,

Arrangements for driving windlasses by steam power, both in heaving and running out the chain.

Also means of lessening the wear of the nipping levers of the hand heaving purchases.

Also means of checking the chain by a block on an axis forcing the chain under a lip in a mouthpiece through which the chain passes.

A.D. 1872, February 15.—No. 484.

HILLÉ, Fritz, of Flora Villa, Brentford, in the county of Middlesex.—"Improvements in the treatment "and utilization of sewage and the manufacture of manure therefrom."

This Provisional Specification describes a complete system for purifying sewage and producing manure.

The impurities are precipitated and the liquid then passed through charcoal.

The precipitate is mixed with the saturated charcoal and sulphur of ammonia from gas liquor to form manure.

A.D. 1872, February 15.—No. 485.

HIGHTON, Henry, M.A., of Putney, in the county of Surrey.—"Improvements in galvanic batteries."

This Provisional Specification describes:

1. A method of absorbing acid fumes from batteries.
2. Placing the negative element in contact with certain oxidising agents.
3. Using a solution of salt of ammonia of the exciting liquid and bitartrate of potash in contact with the negative.
4. Using a solution of nitrate of soda in contact with the zinc and sulphate of copper with the negative element.

A.D. 1872, February 15.—No. 486.

WARD, Edward, of Southport, in the county of Lancaster.—"Improvements in the manufacture of "vesuvians, fuzees, or other matters used for lighting pipes, cigars, and other similar purposes."

The features of novelty which constitute my invention consist in coating the ends of splints of wood, such as are used in the manufacture of vesuvians, or other cigar or pipe lights, with a petrifying or non-combustible substance for the purpose of preventing the charcoal or other igniting composition forming the head of the match from burning through the stem or splint and allowing the head to fall off during the process of lighting cigars, pipes, and other similar articles.

A.D. 1872, February 15.—No. 487.

NUTTALL, William, pattern designer, and **NUTTALL, Thomas**, manufacturer, both of Walmersley near Bury, in the county of Lancaster.—"Certain improvements in looms for weaving."

This invention consists in forming the shed by means of a set of oscillating internal section tappets with movable cam levers connected to allow levers and actuated to raise or lower the treadles by two pattern chains.

A.D. 1872, February 15.—No. 488.

TOUCHE, Jean Jacques Philippe Victor, of Abbey Road, St. John's Wood, in the county of Middlesex, artist.—"An improved mode of and apparatus for preparing roadways."

The object of this invention is to prepare the surface of roadways which are furnished with a coating of asphalte or equivalent material, so as to remove the liability of horses slipping thereon.

A.D. 1872, February 15.—No. 489.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from the Singer Sewing Machine Company* (*Incorporated*) *of the city and state of New York, United States of America.*)—"Improvements in sewing machines."

This invention relates, first, to certain means for guiding the vertical needle of the sewing machine in its descent to pierce the work, the object being to maintain the needle in a vertical position and so to support it near its point while piercing the work as to prevent its fracture. Secondly, to means for controlling the presser foot and leaving the work free to be turned, except at the moment the feed motion takes place.

A.D. 1872, February 16.—No. 490.

GRAHAM, Ralph, and WOOD, Maurice Dale, of Stockton on Tees, in the county of Durham, dentists.—"Improvements in apparatus used in the production of artificial teeth known as dental "articulators."

The inventors use a frame of brass or other suitable material so constructed that the upper and lower models can be removed at pleasure during the process of fitting and arranging teeth, and be replaced by other models when occasion requires it. Thus only one articulator is required for any number of models, instead of the models being fixed as is now the case with other articulators, each articulating frame not being available for more than one set of models at one time.

A.D. 1872, February 16.—No. 491.

GARDNER, Henry, of Essex Road, in the county of Middlesex, engineer.—"Improvements in treating "certain fibres, and more especially the fibre derived from the Baobab tree or Adansonia digitata, to render "them fit for spinning and other useful purposes, and in machinery therefor."

Steeping the fibres in alkaline solutions and afterwards in acid solution, and the use of a machine with a toothed cylinder with heavy grooved rollers or fixed rollers.

A.D. 1872, February 16.—No. 492.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Jules Charles Raimbault, of Chateauneuf sur Sarthe, France.*)—"A new or "improved compound to be used for cleaning metals."

This invention relates to a composition to be used for cleaning all kinds of metal without injury thereto.

It is composed of rotten stone mixed with oxalic acid, to which may or may not be added one-twelfth part of spirits of wine.

The compound is well rubbed on the metal with a flannel; the metal is then wiped with a very dry cotton rag.

A.D. 1872, February 16.—No. 493.

TOMBS, Edward, of Brixton, in the county of Surrey, trimming and tie manufacturer.—"Improvements "in the manufacture of neckties, and other similar articles of wearing apparel."

This invention consists in placing in the band of the neckties or other articles a piece of elastic webbing, or of forming the same of a woven elastic or semi-elastic material or materials.

A.D. 1872, February 16.—No. 494.

SIMONS, William, and BROWN, Andrew, both of the town and county of Renfrew, North Britain, engineers and ship builders.—"Improvements in steam hopper dredgers."

The feature of novelty which constitutes this invention is the forming of the hull with a hopper on each side of the well, through which the ladder and buckets pass, and the forming of the hoppers curved or circular in lieu of rectangular as hitherto.

A.D. 1872, February 16.—No. 495.

EDWARDS, Edmund, of the firm of Edwards and Co., 22, Southampton Buildings, Chancery Lane, in the county of Middlesex, patent agents and engineers.—(*A communication from William McKelvy Thornton and Thomas Alfred Buckland, of Saint Louis, in the county of Saint Louis and state of Missouri, United States of America.*)—" An improved dust shield for railway carriages and mode of hanging such shield."

This invention consists in arranging a guard or shield, consisting of a plane surface of wood, canvas, or other suitable material below the bodies of railway carriages, in a horizontal position parallel with the road, by means of adjustable rods. Where the shield described is fitted to the truck which supports the wheels, it is made in three portions bolted together; the central portion being between the wheels, and the two outer portions being outside the wheels, so that the wheels may be easily removed if required. The parts of the shield fitted to the wheel trucks and the intermediate part under the body of the carriage are jointed together by means of suitable bolts.

The shields described are suspended beneath the carriages by means of rods, the length of which is adjustable by screw swivels. Some of these rods are arranged vertically to carry the shield, and some diagonally or horizontally to prevent too great side or end movement of the shield.

A.D. 1872, February 16.—No. 496.

BAYLEY, Edward Hodson, of 42, Newington Causeway, in the borough of Southwark, in the county of Surrey, wheelwright and contractor.—" Improvements in fire escapes."

This invention consists of,—

1st. Trussing the fly and other ladders that are appended to the main ladder, by means of wire ropes or rods strained over or fastened to struts projecting downwards from the uprights, at least two struts in each upright being used.

When wire ropes are employed the struts may be fitted with rollers, over which the wire ropes may pass.

2nd. The struts clip the upright by a clip, the two parts of which are bolted together by a bolt separate from the woodwork of the ladder, not passing through it.

3rd. The levers for raising the fly ladder are connected underneath the shoot by a swinging crosshead, thus avoiding the necessity for a " quadrant " and enabling one rope to act upon both levers.

4th. Trussing the main ladder by means of wire ropes or rods strained over or fastened to suitably placed semi-circular trussing irons, that transversely connect the uprights underneath the shoot, there being at least two semi-circular trussing irons to the said mainladder.

5th. In a hinge to connect an upper ladder to the fly ladder, one hinge to each upright of the compound ladder; the knuckle pieces and pins project on the upper side of the ladder. A spring bolt fastening (self acting) or a sliding bolt fastening may be used to each hinge.

6th. Using a copper wire-work, or other metallic shoot, which is rigid and of a semi-circular shape, or nearly so, in cross section.

The meshes are rectangular or square. The thick wire, fastened to the upright to which each transverse wire of the shoot is jointed, is of copper or tinned iron, or of iron coated with copper. The transverse wire is jointed to the thick wire by a twist which passes once round the thick wire and then round itself one or two turns. At the bottom of the shoot is an elastic bag or trough to break the shock of any person sliding down.

A.D. 1872, February 16.—No. 497.

WILLIAMSON, George, engineer, of Hunslet, near Leeds, and **WILLIAMSON, William Henry**, draughtsman, of Manningham, near Bradford, both places in the county of York.—" Improvements in the " construction of the travelling wheels of traction engines, road rollers, steam carriages or other traction " vehicles; and in the construction of wheels, pulleys, or drums for transmitting power in connection with " such vehicles, or where power is required to be transmitted by means of cords, ropes, or belts."

This invention comprises various combinations or modifications in the construction and arrangement of the component parts of the travelling wheels of traction engines, road rollers, steam carriages, or other traction vehicles; and in the construction of wheels, pulleys, or drums for transmitting power in connection with such vehicles, or where power is required to be transmitted by means of cords, ropes, or belts.

The first part of the invention relates more particularly to the construction of the travelling wheels, the object being to enable them to obtain a smooth, flat, and elastic tread on the road, and also to allow them to accommodate themselves more readily to the inequalities of the ground over which they travel.

According to one modification, we use an outer flexible tyre of steel in combination with a rigid wheel and separated from it by an elastic cushion, or, as we prefer, in combination with movable arms arranged radially about an elastic boss.

According to a second modification we use an inner flexible tyre or hoop.

According to a third modification, the flexible tyre is entirely omitted, the outer ends of the arms or segments forming the outer circumference of the wheel, and being rounded more than is due to the radius of the wheel. The segments are held in position by a retaining ring or by connecting links.

According to a fourth modification, the flexible tyre is employed in combination with elastic packing, and with rigid wheel, and with or without the elastic boss and movable arms.

According to a fifth modification, the arms are round, with inner ends forged on them, which fit into recesses in the elastic cushion of the boss, and are held therein by the retaining bolts.

The second part of the invention relates more particularly to the construction of a non-elastic spherical boss for the travelling or traction wheels generally, but more particularly for those of road rollers, so that the wheel or roller will readily accommodate itself to any irregularity of the road or ground over which it travels.

The third part of the invention relates to an elastic grooved wheel or pulley, more especially applicable for the tractive wheels of climbing locomotives and carriages, or for transmitting power by means of cords, ropes, or belts.

A.D. 1872, February 16.—No. 498.

RACEY, George, and YOUNG, James, both of Saint George's in the East, in the county of Middlesex.—"Improvements applicable to fire escapes, drop curtains of theatres and other buildings, for the purpose "of preserving human life and property from the effects of fire."

The features of novelty of this invention consist, in employing mica and asbestos separately in the construction of fire escapes and drop curtains for theatres and other buildings, to preserve human life and property from the effects of fire.

A.D. 1872, February 16.—No. 499.

MARSDEN, Henry Louis Delabene, of Louth, in the county of Lincoln, surveyor and lithographer.—"Improvements applicable to lithography, zincography, engraving, and such like processes of producing "prints or impressions."

The sketch or copy of the drawing, writing, tint or colour intended to be printed is made with indian ink, water colour, or other substance mixed with water or other fluid, so that the mixture is not of a greasy nature on lithographic transfer paper (or paper or other substance similarly used) coated with starch, gelatine, paste, or other similar coating by drawing with a pen, brush, or water colour, pencil writing, stencilling, or in any other convenient manner or combination. The paper or other substance used is then damped on the side not having thereon the sketch or copy, and the same is wholly or partially transferred to the stone or plate by pressure in the same way as a transfer of greasy lithographic ink is made, and, after the stone, plate, or block has been well washed with water and if desired with spirit of turpentine, the reversed sketch or copy is ready for the draughtsman's or engraver's use, or if desirable it may be used by an engraver without being washed.

A.D. 1872, February 16.—No. 500.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from William Joseph Bernard Mills, of Philadelphia, Pennsylvania, and De Witt Clinton Taylor, of Elizabeth, New Jersey, both in the United States of America.*)—"Improvements in the "manufacture of boots and shoes and in machinery therefor."

The first part of the invention relates to bevelling and channelling the edge of the shoe soles preparatory to nolding them, and consists of revolving cutters in combination with a feed wheel and table, the table being placed on an angle, whereby the sole is inclined on to the feed wheel, which carries it around to be operated upon by the bevelling and channelling cutters.

The second part of the invention relates to the molding of the soles, and consists of a form, a surrounding guard, and combined platten and follower operated by suitable mechanism for pressing the soles after they have been bevelled and channelled into the proper form for confining them to the last for sewing them to the uppers.

The third part of the invention relates to certain improvements in lasts, by means of which the soles are held securely while being sewed to the uppers. The improvement consists in means for clasping a circumferential turned edge of the soles to hold the latter securely on the last while being sewed to the uppers.

The fourth part of the invention relates to a peculiarly shaped rest plate, which is confined to a fixed part of a sewing machine, upon which rest plate the last is held and turned around during the sewing operation, the bottom circumferential edge of the last having a corresponding counter form and so arranged that the channel of the shoe sole shall always maintain the exact position to be entered by the awl and needle.

A.D. 1872, February 16.—No. 501.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Joseph Martin, of Lowell, Massachusetts, United States of America.*)—"Improvements in shuttles for weaving narrow fabrics."

The said invention consists, first, in the use of an open-backed shuttle, the open back being formed by two projections which render it possible to use a spool of twice the length in common use and at the same time enable the operator more easily to remove the said spool from the shuttle. Secondly, in the application to the said shuttle of two tension bars in combination with two springs, one of which is at each end of the shuttle, the said tension bars operating to prevent the yarn from being drawn from the spool faster than is desired.

A.D. 1872, February 16.—No. 502.

BELL, Andrew, of Huddersfield, in the county of York, engineer, and **WALKER, Joseph**, of Heckmondwike, in the same county, engineer, millwright, and ironfounder.—"An improved appliance to "distilling, brewing, and other chemical processes or purposes."

This invention consists in the application and use of cast iron spiral or coil pipes in the processes of distilling, brewing, manufacturing chemicals or chemical products.

A.D. 1872, February 16.—No. 503.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Gormly Myers, of the city and state of New York, United States of America.*)—"Improved operating mechanism for washing machines and churns."

I apply my said invention to a washing machine as follows:—I provide the vertical spindle or shaft, which carries the beaters and extends through the bottom of the case or tub of the machine, with a stuffing box. Below this stuffing box the said shaft carries a fly wheel. To one arm of this wheel I connect a rod whose outer end is attached to the lower end of a vertical lever which has its fulcrum in a small bracket secured to the outside of the tub. The upper end of this lever is provided with a handle.

A.D. 1872, February 16.—No. 504.

TAYLOR, Robert Minton, of Fenton, near Stoke upon Trent, in the county of Stafford.—"Improve- "ments in means or apparatus for the manufacture from pulverized or powdered clay of castor runners, "door knobs, and other articles requiring a hole through or a recess in them."

The object of the invention is to obtain increased facility and accuracy in the manufacture from clay in a pulverized or powdered state, of castor runners, door knobs, and other articles requiring a hole through or a recess in them.

In proceeding to effect the improvements, the pulverized or powdered clay is moulded into the desired form by compression, as has heretofore been practised in the making of tiles and tesserae, and the apparatus employed is provided with a ram and top plunger, similar in their operation to those heretofore employed, but there is attached thereto a ring or guide to regulate the depth of pressure, and thereby insure accuracy in the thickness or depth of the articles produced.

The central hole or receptacle of the apparatus forming the matrix or die is provided with a movable bottom or bottom plunger, formed to slide on a fixed rod or stem, corresponding in figure to that of the desired hole or recess in the article produced.

When the desired compression of the clay used in forming the article has been effected, the rising of the bottom plunger on the fixed rod or stem releases or lifts the article produced.

The matrix or box, in which the moveable bottom slides, is pierced with holes for releasing compressed air, and preventing the article from being what is technically called "windblown."

A.D. 1872, February 16.—No. 505.

MUSGRAVE, William, of No. 14, Alderson Street, South Shields, and **MUSGRAVE, Ralph Christopher**, of Norton, near Stockton upon Tees, both in the county of Durham.—" Improvements in " apparatus for looping or producing eyes on wire."

The object of the invention is to facilitate the production of loops or eyes on wire.

In carrying out the improvements the wire to be operated upon is in coils placed on a reel or " swift " at one end or part of the apparatus.

One end of the wire is then attached to a looping peg, when by a wheel and pinion, the teeth of which take into the teeth of a rack, motion is given to the rack, and each revolution of the wheel advances the wire a distance equal to that between respective loops or eyes, and loops it on to a succeeding peg until all the required loops on a length of wire have been formed, when that length is cut off by shears or nippers.

The motion of the wheel is reversed to take the rack and pegs back to proceed again as before until the whole of the wire on the swift has been worked into the required number of lengths with the loops.

By these means facility is afforded for the manufacture of wire work for screens, malt kiln flooring, and other uses rendering lacing or binding unnecessary.

A.D. 1872, February 16.—No. 506.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Nathan Thompson, of Brooklyn, in the state of New York, United States of America.*)—" An improvement in lever punches, applicable also to die presses, stamps, and " shears."

This invention relates to the connection of the working cutter, punch or tool proper of the implement or machine within the fulcrum or bearing of its operating lever, whereby a very powerful or effective action is obtained.

A.D. 1872, February 16.—No. 507.

STURGEON, Thomas, of 7, Corn Exchange, Leeds, engineer. — " Improvements in machinery and " apparatus for dressing and furrowing millstones, and for dressing other stones."

I employ a metal stuff which rests on the stone and carries a moving saddle. The saddle is furnished with a transverse slide carrying one or more chisel holders, to which an upward motion is imparted by mechanism, and which drop by their own weight.

The blow can be regulated by adjusting stops.

The saddle is moved backwards and forwards by hand.

A traversing motion is given to the traverse slide by means of a screw, which is turned by a wheel at one end coming in contact with an adjustable pawl.

This wheel may be changed, so as to vary the dressing, and make it coarse or fine.

In dressing ornamental mouldings or furrows and lands of millstones I use a guide or stop of the required form, which regulates the cutting.

By one part of the invention the necessary motion may be imparted to the crank by means of toothed wheels worked by a pinion gearing into a rack formed on the staff, the crank being thus revolved whenever the saddle is moved to and fro. Or the crank may be revolved by hand, and so geared to the pinion which works in the rack as to cause the saddle to move to and fro whenever the crank is revolved. Or various arrangements of cords and pulleys might be used instead of racks and gearing.

When the revolving motion of the crank is made to impart the to and fro motion to the saddle, the traversing motion may be arranged to be thrown out of gear, so that one or more blows may be struck in the same place.

Instead of a guide a parallel motion may be used to carry the chisel holder, and it can be so arranged that the chisel can work at either side of the centre of the cross slide.

Friction rollers may be fixed at each end of the saddle.

The chisel holder is so arranged that the chisel can be lifted and kept off the stone when desired.

Springs may be used to increase the force of the blows or the speed at which they are repeated.

In some cases, in order to reduce the power required for working the saddle to and fro, a lever may be used connected to the saddle.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 10 to August 16, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, February 17.—No. 508.

HARGREAVES, James, of Widnes, in the county of Lancaster, chemist, and **ROBINSON, Thomas**, of the same place, ironfounder.—" Improvements in the production of chlorine and hydro-chloric acid, and in " apparatus employed therein."

This consists in mixing chloride of sodium or chloride of potassium with oxide of chromium, to which magnesium or manganese, either in the form of oxide or as a salt, may be added. The mixed mass is moulded or formed into bricks or pieces and placed in a furnace or chamber heated on the outside. Atmospheric air or oxygen is admitted amongst the bricks or pieces of the mixture; the sodium or potassium is thereby converted into chromate and chlorine evolved.

When we wish to produce hydrochloric acid we add water or the vapour thereof to the air or oxygen used to oxidise the bricks or pieces of the mixture. A series of connected furnaces or chambers may be employed, the passages and dampers of which are so arranged that each furnace or chamber may become the first, intermediate, and last of the series.

The furnaces or chambers may be constructed of brick or other fire resisting material, or of iron or other metal lined with brick.

The atmospheric air or oxygen may be superheated, so as not to cool the mixture at the point of entrance, but it is not advisable to heat the mixture so as to fuse or flux the mass. The proportions of chloride of sodium or potassium and oxide of chromium may be varied, the latter being in excess; we find one part of either of the former with from two to three of the latter to answer.

Under a modification the air or oxygen employed to oxydise the mixture is also used for heating such mixture, external firing being dispensed with. A chamber or series of chamber may be used and preferably covered or surrounded by materials which are slow conductors of heat, such as magnesia bricks.

A.D. 1872, February 17.—No. 509.

HARGREAVES, James, of Widnes, in the county of Lancaster, chemist, and **ROBINSON, Thomas**, of the same place, ironfounder.—" Improvements in the manufacture of alkalies and in apparatus employed " therein."

This consists in obtaining carbonates and hydrates of soda and potassa by reducing chronates of soda and potassa (preferably the chronate produced in the manufacture of chlorine and hydrochloric acid specified as of even date herewith) with carbonic oxide, hydrogen, hydrocarbon, or other gases or vapours which on combustion with oxygen yield carbonic acid or water or a mixture of these. The said gases we call reducing gases.

Hydrogen is used where hydrates are desired, and carbonic oxide or hydrocarbons when carbonates are desired. Steam may be admitted when the hydrocarbons are rich in carbon.

The chromates or either of them are placed in a closed vessel and heated preferably to a dull red heat, and the said reducing gases admitted to the vessel amongst the mass, until the whole or nearly the whole is converted into oxide of chromium and soda or potassa in the state of hydrate or carbonate. The closed vessel is allowed to cool so far as not to allow its contents to be reconverted into chronate on coming into contract with the atmosphere. The alkalies, that is the hydrates or carbonates of soda and potassa, are afterwards dissolved out in any ordinary manner.

Another modification consists in mixing the chronate of soda or potassa with carbon or carbonaceous compounds and heating them together in a close vessel, or heating them and then placing them in a vessel where they are kept from contact with the air and preferably in the presence of some reducing or non-oxidising gas.

The oxides of chronium may be used again in the manufacture of chronates of soda and potassa as set forth, and also in the manufacture of chlorine specified in an application for Letters Patent lodged with this.

A.D. 1872, February 17.—No. 513.

ANDERSON, James, of Newbuildings, in the county of Londonderry, Ireland.—" Improvements in " reducing oxides, and in obtaining iron, sodium, potassium, phosphorus, chlorine, or their compounds, " and in apparatus therefor."

One improvement consists in utilising the gases issuing from the top of the furnace by employing a portion of the carbonic acid they contain as a means for returning heat into the furnace, and for introducing additional carbon.

The furnace for carrying out the improved processes is somewhat like an ordinary blast furnace, but the top is covered in and fitted with various valved inlets or doors for the introduction of the materials. There is a central inlet for coal or carbonaceous matter, and a set of inlets round it for the ores or oxides, the silicates, aluminates, or other salts, and the lime or flux. It is preferred to draw the gases out of the furnace by exhausting apparatus. Only a comparatively small portion of the coal is to be introduced by the central inlet at the top, the larger portion being put into chambers or channels formed at the sides of the lower part of the furnace. One or more horizontal or nearly horizontal passages are formed in connection with the hearth at a suitable height for the slag to flow off by leaving the iron in the bottom of the hearth to be withdrawn by a separate outlet; and the air supply enters by what may be termed the slag passage or passages, and in doing so takes up heat from and so cools the slag. The air, thus entering and becoming heated in the slag tunnels and passages, finds its way into a gallery formed round the lower part of the furnace, whence it enters the interior, first passing through the coal or coke in the bottoms of the lateral coal chambers, and thereby having its oxygen converted into carbonic acid. The coal in the chambers becomes gradually coked as it descends through the action of portions of the hot gases resulting from the combustion in the lower part and passing up through it, and the gases and vapors evolved from it are led by suitable passages into the interior of the furnace to assist in reducing and heating the ores. At and above the part of the furnace where the reducing action terminates air may be admitted to complete the combustion. Provision is made for the withdrawal of potassium, sodium, phosphorus, sulphur, and their compounds as described in the Specification of Patent (No. 718) of 1871. Or the condensation of the vapors may be effected by passing the gases and vapors through a steam boiler.

By a further modification wood charcoal or wood may be put into the central channel in the upper part of the furnace. And when wood is used the volatile matters driven off from it whilst it is being coked by the heat are led by a pipe to a refrigerating apparatus in order to separate condensable matters, the uncondensable gases being afterwards returned to the furnace.

A.D. 1872, February 17.—No. 514.

HENDERSON, Thomas, of Glasgow, in the county of Lanark, North Britain, merchant.—" Improvements in screw steamers."

The invention consists in constructing a screw steamer with two screw apertures, one before the other, in a line with the keel, the after one being of the ordinary dimensions and the forward one of about half the dimensions of the other, and each being fitted with a separate propeller shaft and screw. The forward screw is of a size suitable to work in the space available between the keel and the shaft of the after screw. The two propeller shafts may be connected to one set of engines or to separate sets of engines; or the smaller shaft may be fitted with coupling appliances admitting of its being connected either with the main engines or with a set of smaller engines.

A.D. 1872, February 17.—No. 516.

DEFRIES, Henry, of the firm of Jonas Defries and Sons, of Houndsditch, in the county of Middlesex.—" Certain improvements in railway carriage, street, and other lamps."

This invention consists, firstly, in surrounding a lamp above the flame with an outer reflector, which in the case of railway carriage lamps is fixed to the inside of the roof of the carriage, and in street and other lamps may be supported by arms or stays from the lamp frame or otherwise. The object of this improvement is to increase the reflecting surfaces without increasing the size of the actual lamp or lantern enclosing the burners. Secondly, in placing beneath the flame, and either within or outside of a railway carriage, street, or other lamp, a reflector to be used simply in conjunction with the ordinary top reflector of a railway carriage lamp or in conjunction therewith, and with the outer reflector of this invention, or in conjunction with any reflector placed above the flame of a street or other lamp. By the use of this improvement the light from the top reflector within the lamp being thrown down on to the reflector below the flame, is again thrown upwards and when the upper outer reflector of this invention is also used the light will again be thrown downwards and laterally and thus be diffused throughout the compartment of the railway carriage or wherever the lamp may be used throughout a greater radius than would otherwise be the case.

The number of lights within the lamp whether oil or gas is optional, and the shape of the reflector regulated by the distribution to be given to the light.

A.D. 1872, February 17.—No. 517.

SCRUTON, Thomas, of Birmingham, in the county of Warwick, tailor and outfitter.—" Improvements " in coffins."

According to this invention the outer part or coffin proper consists of a case and lid, the lid being hinged to the side of the case and secured by locking. One end of the coffin is made removable, so as to be capable of being lifted vertically, and when so lifted the end of the coffin is open and the shell can be inserted into the coffin at the open end by a sliding motion. The upper part or cover of the shell is made of glass. Gaseous matter is permitted to escape from the shell by a flexible pipe.

An ornamental framing serving as a padding is placed between the shell and the lid of the coffin. The ordinary coffin handles are dispensed with and the coffin is carried by means of straps or bands passed underneath the coffin and terminating in handles.

By these improvements facilities are afforded for the introduction of the shell into the outer part or coffin proper, ready means provided for obtaining a sight of the corpse, and great security against improper interference.

A.D. 1872, February 17.—No. 520.

RICE, Joseph, of No. 384, Oxford Street, in the county of Middlesex.—" Improvements in the con- " struction of fire grates, stoves, and furnaces."

This Provisional Specification describes the so constructing fire grates, stoves and furnaces, that the products of combustion are led away from the front immediately over the fire door or front bars.

A.D. 1872, February 17.—No. 521.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from George Henry Earnest, of Springfield, Ohio, United States of America, mechanic.*)—" Improvements in breech-loading fire-arms."

This invention consists, first, in arranging a swinging breech block entirely independent of the lock. Secondly, in constructing the laterally swinging breech block of two parts, one part of which has a movement independent of the other, both upon its axis and in the direction of the length of the arm. Third, in operating the firing pin or needle so that after firing the charge it will be instantly relieved and returned to its place within the breech block before the latter is again opened. Fourth, in constructing the firing pin or needle of two separate and distinct sections or parts, one of which, the needle proper, is arranged within the breech block and has a movement laterally therewith, and the other is arranged within the stock breech, both being operated by a sliding plate and separate springs. Fifth, in constructing the breech block with an annular disc sleeve in connection with a recess in the end of the barrel to form a seal. Sixth, in combining a clamp screw with the stock band for the purpose of firmly uniting the stock and the barrel. Seventh, in a peculiar shell retractor operating device, by means of which the empty shell of the cartridge is automatically retracted in opening the breech, and may be automatically returned to its normal position by the closing of the breech. Also in the construction and arrangement of the several operating devices of the arm.

A.D. 1872, February 19.—No. 535.

GILKERSON, Watson, of Diss, in the county of Norfolk, chemist.—" An improved measure for liquids."

The feature of novelty in this invention is the prevention of the waste which usually occurs in drawing off any liquids by means of a measure.

This is secured by means of one cylinder within another; the inner cylinder being the real measure, and the outer cylinder being of greater height than the inner. The two cylinders are connected at the top, and in such connection is an opening at the top of the inner cylinder. When the measure is full, the liquid overflows through this opening into the space or receptacle between the two cylinders, and the contents of the receptacle being returned to the store the overflow is thus saved.

A.D. 1872, February 21.—No. 554.

HENDERSON, James, of New York, in the United States of America, but at present of No. 166, Buchanan Street, Glasgow, in the county of Lanark, North Britain.—" Improvements in converting cast " iron into steel and wrought iron, and purifying cast iron for foundry and other purposes."

The feature of novelty which constitutes this invention is the employment of fluor spar, artificial fluoride of calcium, fluo-silicate of lime, and cryolite in combination with silica or silicate of alumina, carbonates of iron, carbonate of lime and other carbonates, also with sulphates, and with titantiferous iron ores, or oxides of titanium, oxides of manganese, chrome iron ores, or wolfram, for the purpose of converting cast iron into steel or wrought iron, or purifying it for foundry and other purposes.

A.D. 1872, February 21.—No. 555.

CORY, William Henry, and **CORY, Edward**, both of No. 25, Royal Crescent, Notting Hill, in the county of Middlesex.—" Improvements in the manufacture of artificial fuel blocks, and in machinery for " compressing the same, which machinery is also applicable for compressing other materials into blocks."

This invention consists, firstly, in making artificial fuel blocks of a mixture of small coal or other carbonaceous matter with cement and red lead or silicate of soda or silicate of potash, and secondly, in a machine, for compressing such fuel and other substances into blocks, consisting of a revolving table with recesses containing plungers raised from below by an inclined plane, so as to compress the fuel filled into the recesses against a fixed plate, covering a portion of the table with appliances for rounding the corners of the blocks, for regulating the quantity of fuel for each block, and for removing the blocks from the moulds when formed.

A.D. 1872, February 21.—No. 556.

DINGLEY, William, of Blake Heath, Rowley, in the county of Stafford, engineer.—" An improvement " or improvements in the manufacture of iron and steel."

This invention consists in treating iron or steel in the process of puddling, for the purpose of effectually and rapidly removing any phosphorus or sulphur contained in the iron or steel. To effect this, crude sulphate of soda commonly called salt cake is introduced into the puddling furnace and upon the surface of the melted iron or steel after the latter has been puddled for a short time, and after the addition of the salt cake, the puddling process is completed in the usual way.

It is preferred to use 12 ounces of salt cake to each heat of 4 or 4½ cwts. of iron or steel, but the inventor does not limit himself to this quantity.

A.D. 1872, February 28.—No. 628.

BRANDON, Alexander Horace, of 13, Rue Gaillon, Paris, France, civil engineer.—(*A communication from Alfred Weed, a person resident at Boston, Mass., United States of America.*)—" An improved machine " for cutting files."

The object of this invention is to make the feed of the file contingent upon the character of each tooth cut, by making the tooth itself or the spur raised behind the cutter by its blow an agent in the feed.

A.D. 1872, February 29.—No. 630.

HAMER, William, of the Hill, Winnington, Northwich, in the county of Chester, salt-proprietor.— " Improvements in apparatus employed in the manufacture of salt."

This invention relates to the salt-pans used in the manufacture of salt, and consists, firstly, in covering the said pans and leading the steam rising therefrom below other pans.

Secondly, in employing a mechanical agitator to cause the subsidence of the salt crystals.

And lastly, in discharging heated air into the space enclosed by the cover of the salt pan.

A.D. 1872, August 10.—No. 2389.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Hilaire André Levallois, a person resident at No. 26, Rue de Chabrol, Paris, in France, metallurgist.*)—"A new or improved process of manufacturing cast steel."

The invention relates to improvements in the production of a combined quality of cast steel not easily liable to rust, and consist in the manufacture of steel composed of an alloy of iron, tungsten, and nickel in various proportions.

A.D. 1872, August 14.—No. 2416.

CHANDLER, Samuel, senior, **CHANDLER, Samuel**, junior, and **CHANDLER, Josiah**, of London Road, Southwark, in the county of Surrey, gas engineers.—"Improvements in dip pipes for regulating the "seal in hydraulic mains used in the manufacture of gas."

The invention is designed for regulating the depth of seal in the hydraulic main by means of turning a hand wheel, which either raises or lowers the regulating "dip pipe" into or out from the hydraulic main and so gives the dip required.

A.D. 1872, August 15.—No. 2435.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Hiram Quincy Sanderson, of the city and state of New York, United States of America.*)—"Improvements in railway carriage springs."

This invention consists,—First, in the mode of arranging and holding together metallic plates, and cross bars or fulcrums to form a carriage spring, which shall work without producing friction or abrasion of its parts. Second, in lining the bearing surfaces of the fulcrums with india-rubber or other similar packing, placed in recesses formed for the purpose, in such a manner that the yielding of the packing, and the extension of its bearing surface upon the plate materially increase the range and efficiency of the combination as a spring. Third, in making the intervening fulcrums spherical in form, and of india-rubber or other elastic material, to perform the double function of springs and friction rollers, where it is necessary to provide for a rotary motion, as at the king bolt of a truck, or anywhere between the truck and body of the carriage, the plates on the truck and bolster beam of the carriage body being suitably formed with concave recesses for their reception.

A.D. 1872, August 15.—No. 2437.

BARBOUR, Edmund D., of the city of Boston, in the state of Massachusetts, of the United States of America.—"An improved calculating machine."

This invention consists,—

Firstly. In the arrangement of a series of cylinders revolving upon a shaft, or plates sliding in parallel grooves, in close proximity but independently of each other with cog-teeth distributed in rows upon their peripheries or faces by predetermined calculations, so that, when the said cylinders or slides are arranged in certain relations to each other, certain rows of the cog-teeth of the different cylinders or plates are brought in line, and by means of a registering device having pinions, which are caused to engage with the cog-teeth of the cylinders or plates, a sliding movement of said register communicates motion to dials, causing the dials to turn as many parts of a revolution as there are cog-teeth engaged on the cylinders or plates.

Secondly. In the construction of a registering slide composed of two plates secured together, with a space between and having pinions arranged on the bottom plate, with their teeth projecting through it a sufficient distance to engage with the cog-teeth of said cylinders or plates, and also connecting between said plates with spindles having dials attached, so that the movement of each pinion, produced by its contact with the cog-teeth of the cylinders or plates, may be registered and indicated upon the dials.

Thirdly. In the means employed for setting the said cylinders or plates in a certain relation to each other, preparatory to performing any arithmetical operation by the action of the said registering device.

Fourthly. In the means employed for the purpose of revolving the cylinders or moving the plates simultaneously when required.

Fifthly. In an arrangement of levers, with pawls and ratchet-wheels, connected to said registering device, for effecting the carrying of the tens.

Sixthly. In an attachment of supplementary dials to the registering device and means for obtaining the quotient in division.

A.D. 1872, August 15.—No. 2442.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Ferdinand Imhorst, of the city and state of New York, United States of America.*)—"Improvements in chamber-vessels."

This invention consists in the arrangement of an inwardly projecting flange on the upper edge of a chamber pot in such a manner that when the vessel is suddenly moved the danger of spilling the contents is materially diminished, as when the contents reach or splash against the upper part of the vessel the flange prevents their escaping or splashing over. The said invention consists also in forming the chamber vessel or pot especially at its mouth of an oval, pear, or egg shape.

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A.D. 1872, February 20.—No. 543.

HUDSON, Frederic William, of No. 227, Blackfriars Road, in the county of Surrey, tin barrel maker.—"Improvements in stopping and releasing spring and other roller blinds."

The invention consists of a wedge acting against the roller or flanges attached thereto so as to stop the blind directly the wedge is brought in contact therewith, and so that the roller will revolve freely so long as the wedge is not touching it, but directly the wedge comes in contact with the roller it causes it to stop.

The invention is intended to be applied to common roller blinds and also to spring roller blinds. The wedge used for such different classes of blinds is not similar in shape or form, but the action and effect is the same in both cases. The invention is *the application of the wedge* by pressure between a stationary and a revolving substance, the effect of which when applied is to stop the roller; and this is claimed in whatever shape, form, or material it may be made.

A novel and important feature resulting from this invention is that the working of the blind is *noisless*.

Another very important improvement consequent upon the said invention is that the action is *inside the roller* thereby allowing the cloth of the blind to be brought within a quarter of an inch of the bracket. Both of these improvements the inventor claims.

A.D. 1872, February 20.—No. 544.

CUNNINGHAM, Henry Duncan Preston, gentleman, of Bury House, Alverstoke, Hants.—"An improvement in fork guards.

The fork guard turns on an axis, and has a counterpoise below the fork, so that the guard rises when the fork is taken up for use.

A.D. 1872, February 20.—No. 545.

NEWTON, William Edward, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Richard March Hoe, of the city and state of New York, United States of America.*)—"Improvements in lithographic printing machinery."

This invention consists, first, in improved means for regulating the supply of water to be damping or wetting apparatus of lithographic printing machinery; and, secondly, in constructing the reciprocating tables so as to be capable of receiving two or more stones to be printed from simultaneously.

A.D. 1872, February 20.—No. 546.

JAQUES, James Archibald, of Tottenham, in the county of Middlesex, chemist, and **OAKLEY, John Thomas**, of Grange Road, Bermondsey, in the county of Surrey, engineer.—"Improvements in machines for grinding and surfacing articles made of iron or steel."

This invention relates to improvements upon an invention for which we (in conjuction with John Americus Fanshawe) obtained Letters Patent dated 8th March 1869, No. 697, and has for its object to render the invention therein set forth more generally useful.

A.D. 1872, February 20.—No. 547.

RICH, Sidney William, of Chenies Street, in the county of Middlesex, analytical chemist.—"An improved process for treating aluminous schist or shale."

Schist is burnt in heaps, then saturated and soaked with water for dissolving the chemical bodies; the liquor is percolated through powdered magnesia to doubly decompose the chloride, etc., which are afterwards separated by crystalization or by acids.

A.D. 1872, February 20.—No. 548.

ANNANDALE, Alexander, the younger, of the Beltonford Paper Mills, Dunbar, North Britain.—"Improvements in machinery or appliances for the manufacture, renewal, and repair of knotter plates used in paper mills."

Knotter plates are made in sections preferably and arranged in skeleton frames. The slits are cut by circular saws between which are placed rollers for pressing upon the plate and smoothing the surface.

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lines of type of the same character, as required for machine composing, and also directly into the type channels or frames used in such machines, though the invention is applicable for distributing type down shoots or tubes into the ordinary "case." The invention consists in what the inventor terms a "distributing stick" and in means for inserting a line of type at a time into this stick, which has a follower for pushing the type forward and a pusher and slide for discharging from the stick each type separately, when the end of the stick (which is held in the hand of the operator) is brought over the channel to which the type belongs, each type being distributed into its proper place by an end movement given by the stick, which movement actuates a swing frame for depressing the pusher in the stick, and another frame having needles that come opposite each type channel to push forward each line of type as distributed. There is a comb piece that regulates the placing of the stick, the teeth of which being of varying lengths also regulate the opening (by moving the slide in the stick) through which the type passes from the stick. There is also an elastic staple piece in each type channel for giving friction to keep the type in position, and pistons or other means are used for pushing up the end type of each class to facilitate hand composing.

A.D. 1872, February 21.—No. 553.

ZIMDARS, Conrad Edward, of 28, Red Lion Square, Holborn, W.C., in the county of Middlesex.—"A new and improved self acting pneumatic fire alarm."

This invention is based upon atmospheric equilibrium, and consists in a new application of a column, either of compressed or rarified air hermetically enclosed in a metal tube, and giving an alarm on the least outbreak of fire.

Branches open to the atmosphere are fixed at various distances on the metal tubes which are to be stopped with a fusible material, such as wax, tallow, &c., and communicating with an air chamber.

The air chamber is expanded by the compression of air in the tubes, which prevents the action of the alarm.

On the outbreak of a fire the heat is conducted by the tube to the nearest branch, which melts the fusible material and allows the compressed air to escape, causing the air chamber to collapse, which sets the alarm in motion.

By reversing the action or rarifying the air in the tubes the same result will be obtained.

A.D. 1872, February 21.—No. 554.

HENDERSON, James, of New York, in the United States of America, but at present of No. 166, Buchanan Street, Glasgow, in the county of Lanark, North Britain.—"Improvements in converting cast "iron into steel and wrought iron, and purifying cast iron for foundry and other purposes."

The feature of novelty which constitutes this invention is the employment of fluor spar, artificial fluoride of calcium, fluo-silicate of lime, and cryolite in combination with silica or silicate of alumina, carbonates of iron, carbonate of lime and other carbonates, also with sulphates, and with titaniferous iron ores, or oxides of titanium, oxides of manganese, chrome iron ores, or wolfram, for the purpose of converting cast iron into steel or wrought iron, or purifying it for foundry and other purposes.

A.D. 1872, February 21.—No. 555.

CORY, William Henry, and **CORY, Edward**, both of No. 25, Royal Crescent, Notting Hill, in the county of Middlesex.—"Improvements in the manufacture of artificial fuel blocks, and in machinery for "compressing the same, which machinery is also applicable for compressing other materials into blocks."

This invention consists, firstly, in making artificial fuel blocks of a mixture of small coal or other carbonaceous matter with cement and red lead or silicate of soda or silicate of potash; and secondly, in a machine, for compressing such fuel and other substances into blocks, consisting of a revolving table with recesses containing plungers raised from below by an inclined plane, so as to compress the fuel filled into the recesses against a fixed plate, covering a portion of the table with appliances for rounding the corners of the blocks, for regulating the quantity of fuel for each block, and for removing the blocks from the moulds when formed.

A.D. 1872, February 21.—No. 556.

DINGLEY, William, of Blake Heath, Rowley, in the county of Stafford, engineer.—"An improvement "or improvements in the manufacture of iron and steel."

Bands and belting for machinery:
- Baker, 287.
- Walker, 331.

Bands and rods for machinery (substitutes for):
- Newton (*Closson*), 274.

Banks. *See* "Embankments."

Bark (disintegrating). *See* "Grinding bark."

Batching jute. *See* "Spinning (opening)."

Baths and bath appliances:
- Gowans, 87.
- Cunningham & Corbin, 361.
- Henman, 396.

Batteries and fortifications:
- Henderson, 514 (*App.* 7.)
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)

Beaming machines. *See* "Warping."

Bearings, journals and steps:
- Lake (*Hitchcock*), 405.
- Lake (*Meneely*), 2050 (*App.* 2.)
- Haseltine (*Sanderson*), 2435 (*App.* 7.)

Bedsteads. *See* "Furniture."

Bellows. *See* "Air-supplying to furnaces."

Bells; ringing bells:
- Handcock, 16.
- Lake (*Allen*), 163.
- Wood, 211.
- Glasspool (*Glasspool*), 276.
- Wheatstone & Stroh, 473.

Belts and bands for wear:
- Edwards, 202.
- Bell, 362.

Binnacles:
- Low, 33.

Bits. *See* "Harness."

Blasting:
- Cranston, 143.

Bleaching fabrics and yarns:
- Rydill, 370.

Blowing engines; fans:
- Higginson, 202.

Blowing or forcing gases. *See* "Forcing air."

Bobbins; spools:
- Gilmore, 29.
- Bash, Bash & Bash, 52.
- Wilkinson, 371.

Boilers (domestic):
- Edwards (*Blessing, Townsend & Jackson*), 1139 (*App.* 42.)

Boilers (horticultural):
- Edwards (*Blessing, Townsend & Jackson*), 1139 (*App.* 42.)

Boilers (papermakers', &c.):
- Roeckner & Lunge, 463.

Boilers (sugar):
- Jarman & Mitchell, 338.

Bones; horn; ivory:
- Cunningham, 55.
- Greenhill, 131.
- Jupp, 417.

Book binding:
- Birdsall, 382.

Books; diaries:
- Newton (*Gateuil*), 366.

Boots, shoes, slippers and clogs; boot jacks:
- Fish & Wotherspoon, 7.
- Lake (*Morris*), 162.
- Hollingworth, 229.
- Lake (*Blake*), 264.
- Parker-Rhodes, 309.
- Lamb, 377.
- Clark (*Sheffield & Mellor*), 399.
- Lake (*Mills & Taylor*), 500.
- Hodges, 733 (*App.* 37.)
- Lake (*Coté & Seymour*), 760 (*App.* 37.)
- Alekan & Alekan, 1141 (*App.* 42.)
- Whittemore (*Landfear*), 2311 (*App.* 5.)

Boring, drilling, rifling and punching metals:
- Hulse, 195.
- Russell, 227.
- Jones, 343.
- Newton (*Thompson*), 506.
- Brown (*Fuller*), 950 (*App.* 40.)

Boring and drilling rock or stone:
- Cranston, 143.
- Beaumont & Appleby, 392.

Bottle stoppers and capsules:
- Stocker, 154.
- Bonneville (*De Mestre*), 174.
- Aylesbury, 248.
- Franklin (*Pyne & Maurice*), 332.
- Betts, 354.
- Betts, 355.
- Bonneville (*De Mestre*), 2211 (*App.* 4.)

Bottles; decanters; filling and withdrawing from bottles:
- Gilmore, 58.
- Lake (*Clarke*), 329.

Boxes; chests; cases; packages:
- Geoghegan, 9.
- Dominy & Russell, 36.
- Warren, 113.
- Johnson (*Frazier*), 144.
- Rollason & Brough, 172.
- Everickx, 260.
- Franklin (*Pyne & Maurice*), 332.
- Grafton, 341.
- Betts, 355.
- Ducomet (*Legris*), 1272 (*App.* 44.)

Brackets:
- Lloyd, 322.

Branding casks, cases, boxes, &c.:
- Geoghegan, 9.

Bread and biscuits:
- Jarman & Mitchell, 338.

Breaks for carriages and railways; stopping trains:
- Galloway, 14.
- Sutcliffe, 43.
- Gombert, 409.
- Smith (*Michaels & Broadwell*), 469.
- Westinghouse, jun., 595 (*App.* 4.)
- Westinghouse, jun., 933 (*App.* 4.)
- Lake (*Emery, Doyen & Sparrow*), 770 (*App.* 37.)
- Westinghouse, jun., 1226 (*App.* 4.)
- Lynch, 1861 (*App.* 51.)

Breaks for machinery:
- Gilmore, 29.
- Pieper, 153.
- Hughes (*Bates, Baker & Ferguson*), 179.
- Smyth, 187.
- Newton (*Reimann*), 216.
- Saunders, 278.
- Harfield, 483.

Breakwaters, sea walls and foreshores:
- Page, 135.
- Tucker, 1669 (*App.* 49.)

Brewing and fermenting; treating beer:
- Gibbs & Borwick, 314.
- Curtis, 327.
- Lake (*Clarke*), 329.
- Bell & Walker, 502.

Bricks, tiles and building blocks:
- Newton (*Morgan*), 266.
- Johnson (*Caldwell*), 340.
- Lake (*Hotchkiss*), 346.
- Boone & Herman, 1590 (*App.* 47.)
- Tucker, 1669 (*App.* 49.)

Bridges; viaducts; draw bridges:
- Kochs, 107.
- Lake (*McLeod*), 443.
- Smith, 921 (*App.* 39.)
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)

Bronzing, gilding and silvering fabrics, paper, pencils, &c.:
- Lake (*Benton*), 157.
- Johnson (*Reckendorfer*), 578 (*App.* 4.)

Brushes and brooms:
- Wood, 211.
- Wood, 212.
- De Tivoli (*Giacomini, jun.*), 221.
- Horsey, 1874 (*App.* 51.)

Buckles and clasps:
- Ashcroft, 30.

Building hoists or elevators:
- Lake (*Silver*), 218.

Buildings:
- Stone, 203.
- Lake (*Hotchkiss*), 346.
- Lake (*McLeod*), 443.
- Cottam, 458.
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Boone & Herman, 1590 (*App.* 47.)

Butter:
- Newton (*Barre-Pin & Barre-Pin*) 37.
- Johnson (*Enault & Co.*), 1951 (*App.* 52.)

Buttons; studs, &c.:
- Alekan & Alekan, 1141 (*App.* 42.)

C.

Cables for telegraphs. *See* "Telegraphs."

Calculating:
- Lake (*Biggs*), 1019 (*App.* 40.)
- Barbour, 2437 (*App.* 7.)

Calendars:
- Edwards (*Dunn, Lewis, Atwood Marshall, Mussey, Bailey, Kilby & Channell*), 777 (*App.* 37.)

- **Camera stands :**
  - Spahn, 1970 (*App.* 52.)
- **Candles ;**
  - Morfit, 140.
  - Clarke, 349.
- **Canisters or provision tins.** *See* "Tins."
- **Cans :**
  - Franklin (*Pyne & Maurice*), 332.
  - Lake (*Shepard & Seaman*), 444.
- **Capsuling bottles.** *See* "Bottle stoppers."
- **Cards ; card cases :**
  - Hunt (*McCrea*), 450.
  - Brower, 2135 (*App.* 3.)
- **Carpet stretchers ; under carpets :**
  - Schlesinger (*Dixon*), 98.
  - Walker, 196.
- **Carriage robes.** *See* "Rugs."
- **Carriages, cabs, omnibuses, waggons, carts and trucks :**
  - Coward, 115.
  - Blumberg (*Greenhill*), 152.
  - Quick & Norminton, 281.
  - Titley, 386.
  - Alekan & Alekan, 1141 (*App.* 42.)
  - Bonneville (*Foubert*), 1479 (*App.* 46.)
- **Carriages, &c. (loading and unloading) :**
  - Blumberg (*Greenhill*), 152.
  - Wood, 302.
- **Cartridge extractors :**
  - Samain, 69.
  - Clark (*Burgess*), 263.
- **Cartridges and cases :**
  - Giffard, 21.
  - Johnson (*Frazier*), 144.
  - Russell, 227.
  - Jones, 343.
  - Lake (*Lovett, jun.*), 895 (*App.* 39.)
- **Cartridges for smoking.** *See* "Tobacco."
- **Carts.** *See* "Carriages."
- **Carving.** *See* "Cutting."
- **Cask and barrel tilters :**
  - Beswick & Potts, 66.
- **Casks :**
  - Geoghegan, 9.
  - Burr (*Prall*), 253.
  - Lake (*Shepard & Seaman*), 444.
- **Casks (tapping and venting) ;**
  - Davis, 130.
  - Gaskell, 190.
  - Bañolas-Arnau, 198.
  - Punshon, 347.
- **Casters :**
  - Stocker, 154.
  - Parry, 239.
  - Taylor, 504.
- **Casting and moulding metals.** *See* "Metals (casting)."
- **Casting and moulding plastic materials :**
  - Stocker, 154.
  - Stone, 203.
  - Lake (*Hitchcock*), 405.
  - Taylor, 504.
  - Lake (*Seibert*), 525 (*App.* 34.)
  - Tucker, 1669 (*App.* 49.)
- **Ceilings :**
  - Stone, 203.
  - Lake (*McLeod*), 443.
- **Cement :**
  - Lake (*Schott*), 279.
  - Gibbs & Borwick, 314.
  - Johnson (*Caldwell*), 340.
  - Lake (*Schott*), 2119 (*App.* 3.)
- **Centrifugal machines :**
  - Budenberg (*Priew*), 235.
- **Cesspools :**
  - Gowans, 87.
  - Seddon, 106.
  - Gatty, 233.
- **Chains ; chain cables ; shackles :**
  - Pieper, 153.
  - Low, 530 (*App.* 34.)
- **Chains and guards :**
  - Clark (*Edge*), 414.
- **Chamber vessels :**
  - Sullivan, 659 (*App.* 45.)
  - Haseltine (*Imhorst*), 2442 (*App.* 7.)
- **Charcoal and coke :**
  - Box, 282.
  - Monckton, 423.
- **Chemical furnaces, &c. :**
  - Woods, 277.
  - Gibb & Gelstharp, 407.
  - Bell & Walker, 502.
- **Chemicals (packing and carrying) :**
  - Lake (*Seibert*), 525 (*App.* 34.)
- **Chlorine and chlorides :**
  - Weldon, 317.
  - Weldon, 359.
  - Hargreaves & Robinson, 508 (*App.* 7.)
  - Anderson, 513 (*App.* 7.)
  - Weldon, 602 (*App.* 5.)
  - Solvay, 1525 (*App.* 47.)
  - Weldon, 1539 (*App.* 47.)
- **Churns :**
  - Lake (*Myers*), 503.
- **Cigar cases :**
  - Dee, 127.
  - Dee, 158.
  - Dee, 160.
- **Cigars and cigarettes.** *See* "Tobacco."
- **Cisterns ; tanks :**
  - Gowans, 87.
  - Cooke, 123.
- **Cisterns for road refuse.** *See* "Roads (cleansing)."
- **Classifying coins.** *See* "Coins."
- **Clay (treating) :**
  - Gibbs & Borwick, 314.
  - Taylor, 504.
- **Cleaning cotton.** *See* "Spinning (opening).
- **Cleaning grain.** *See* "Grain and seeds (treating)."
- **Cleaning metals.** *See* "Metals."
- **Clipping horses.** *See* "Shearing."
- **Clocks, watches and time-keepers ; watch keys :**
  - Dennison, 356.
  - Vale, 360.
  - Edwards (*Dunn, Lewis, Atwood, Marshall, Mussey, Bailey, Kilby & Channell*), 777 (*App.* 37.)
- **Clock-work for driving sewing-machines.** *See* "Propelling or driving."
- **Clutches :**
  - Hughes (*Bates, Baker & Ferguson*), 179.
- **Coal-scuttles :**
  - Lake (*Morison*), 373.
- **Coating and covering leather and cloth :**
  - Lake (*Croasdale*), 148.
  - Hulse & McKay, 381.
  - Lake (*Hitchcock*), 405.
- **Coating metals :**
  - Lake (*Radde*), 121.
  - Weeks, 141.
  - Weir & Weir, 262.
  - Lake (*Morison*), 373.
  - Johnson (*Buzby*), 419.
  - Smith, 921 (*App.* 29.)
  - Haseltine (*Sanderson*), 2435 (*App.* 7.)
- **Coating or covering cylinders or rollers ;**
  - Walton, 176.
  - Dobson, Rushton & Dobson, 292.
  - Wilkinson, 371.
- **Coating or covering wire :**
  - Pigott, 286.
  - Truman, 482.
- **Coating or lining moulds and cores :**
  - Cooper, 296.
  - Abel (*Hainsworth*), 480.
- **Coating wood :**
  - Hyatt, 40.
  - Weeks, 141.
  - Lake (*Hitchcock*), 405.
- **Cocks and taps :**
  - Spence, 56.
  - Blundon & Cleaver, 461.
- **Coffee ; obtaining infusions of coffee :**
  - Gibbs & Borwick, 314.
  - Curtis, 327.
- **Coffins :**
  - Scruton, 517 (*App.* 7.)
- **Coins ; coin blanks :**
  - Seyd, 368.
  - Napier, 402.
- **Colouring fabrics :**
  - Ripley (*Depoully*), 283.
- **Colouring gems or precious stones.** *See* "Gems."
- **Colouring or tinting photographs.** *See* "Photography."
- **Columns ; pillars ; pilasters :**
  - Smith, 921 (*App.* 39.)
- **Combing fibrous materials.** *See* "Spinning (carding)."

- Compasses for ships; field compasses:
  - Low, 33.
  - Clark & Jobson, 256.
  - Middleton, 265.
  - Johnson (*Arson*), 312.
  - Lake (*Biggs*), 1019 (*App.* 40.)
- Compositions for road making. *See* "Roads."
- Compressing or "upsetting" metals. *See* "Metals."
- Concentrating light of gas. *See* "Gas burners."
- Condensers and condensing:
  - Higginson, 202.
  - Johnson (*Ponsard Metallurgical Society*), 426.
  - Lake (*Brayton*), 432.
- Converting motions. *See* "Propelling or driving."
- Cooking:
  - Fothergill, 63.
  - Jowett, 336.
  - Jarman & Mitchell, 338.
  - Billing, 391.
- Cooling and preserving meat:
  - Walker, 272.
- Cooling rollers:
  - Johnson, 732 (*App.* 37.)
- Cooling slag and scoria on removal from furnaces:
  - Joy, 199.
  - Wood, 302.
- Cooling the head and body:
  - Macintosh & Boggett, 137.
  - Floyd, 225.
- Cooling valves:
  - Cazier, 1941 (*App.* 52.)
- Copying; copying machines:
  - Baggs, 108.
  - Bonneville (*Le Clercq*), 238.
  - Bayly, 319.
- Cordage. *See* "Ropes."
- Cork pressers:
  - Schlesinger (*Dixon*), 98.
- Corks:
  - Bonneville (*De Mestre*), 174.
- Corsets. *See* "Stays."
- Counters:
  - Millar, 244.
- Coupling. *See* "Joining."
- Crimping. *See* "Goffering."
- Crow bars:
  - Schlesinger (*Dixon*), 98.
- Crucibles:
  - Johnson (*Sellers*), 80.
  - Johnson (*Ponsard Metallurgical Society*), 424.
- Cuffs:
  - Carlile, 71.
  - Alekan & Alekan, 1141 (*App.* 42.)
- Cultivating land. *See* "Ploughing."
- Cutting, sawing and planing wood:
  - Cunningham, 55.
  - Last, 285.
  - Smith & Coventry 290.
  - Pace, 369.
- Cutting and dressing stone and slate:
  - Mortlock, 34.
  - Cunningham, 55.
  - Sturgeon, 507.
  - Lake (*Gear*), 579 (*App.* 34.)
- Cutting cloth, leather and paper:
  - Shaw, Ditchfield & Knowles, 122.
  - Lake (*Warth & Jobbins*), 536 (*App.* 34.)
  - Hodges, 733 (*App.* 37.)
  - Lake (*Coté & Seymour*), 760 (*App.* 37.)
  - Fenno & Howe, 1871 (*App.* 51.)
- Cutting files. *See* "Files."
- Cutting india-rubber:
  - Oldroyd, 364.
- Cutting metals:
  - Cunningham, 55.
  - Hughes (*Bates, Baker & Ferguson*), 179.
  - Lake (*Blake*), 264.
  - Rowan, 284.
  - Johnson (*Lawrence*), 339.
- Cutting or finishing cigars:
  - Elman & Brown, 24.
- Cutting peat:
  - Box, 282.
- Cylinders, rollers and drums:
  - Fish, 6.
  - Caspersen (*Blair*), 28.
  - Allerton, 114.
  - Paraire, 125.
  - Lake (*Benton*), 157.
  - Cockill, Shaw, Keir & Craven, 165.
  - Walton, 176.
  - Smith, 182.
  - Bertieaux, 226.
  - Jupp, 417.
  - Lake (*Brayton*), 432.
  - Smith (*Marée & Varlet*), 442.
  - Nichol & Eckersley, 455.
  - Gardner, 491.
  - Johnson, 732 (*App.* 37.)
  - Lake (*West*), 1408 (*App.* 45.)
  - Sullivan, 1689 (*App.* 49.)
  - Imray (*Sulzer, Sulzer & Ernst*), 2193 (*App.* 4.)
  - Haseltine (*Tanner*), 2329 (*App.* 6.)

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- Daggers and dirks:
  - Andrew, 184.
- Damping printing "formes:"
  - Edwards, 73.
- Decanters. *See* "Bottles."
- Dentistry; artificial teeth:
  - Mack, 147.
  - Crapper, 231.
  - Graham & Wood, 490.
- Deodorizing:
  - Seddon, 106.
  - Bostel, 269.
  - Prange & Whitthread, 379.
  - Carter, 465.
  - Carr, jun., 470.
  - Hillé, 484.
- Detectors for ascertaining errors in ships' compasses. *See* "Compasses."
- Diaries. *See* "Books."
- Dies; die presses:
  - Newton (*Thompson*), 506.
  - Johnson (*Reckendorfer*), 578 (*App.* 4.)
  - Lake (*Coté & Seymour*), 760 (*App.* 37.)
- Digging machines:
  - Porter, 1820 (*App.* 51.)
- Disinfecting:
  - Doudney & Adams, 178.
  - Gatty, 233.
  - Hillé, 484.
- Disintegrators:
  - Greenhill, 131.
  - Ungerer, 257.
- Distilling alcoholic and spirituous liquors:
  - Johnson (*Leconte*), 404.
  - Bell & Walker, 502.
- Distilling oils:
  - Coffey, 64.
  - Benson (*Honell*), 799 (*App.* 38.)
  - Platt, 969 (*App.* 40.)
- Distilling water. *See* "Filtering."
- Distributing manure. *See* "Manure distributors."
- Docks; floating docks; basins:
  - Page, 135.
- Doors and gates; door furniture:
  - Galloway, 14.
  - Dominy & Russell, 36.
  - Johnson (*Sellers*), 80.
  - Gilyard, 330.
  - Taylor, 504.
- Drains and sewers; draining:
  - Clark, 27.
  - Seddon, 106.
  - Gatty, 233.
  - Rosborough, 324.
  - Johnson, 472.
  - Smith, 921 (*App.* 39.)
  - Lake (*Carter*), 992 (*App.* 40.)
  - Carter & Carter, 1434 (*App.* 46.)
  - Lake (*Daniels*), 1500 (*App.* 46.)
- Drawing; sketching; drawing boards:
  - Wigzell, 298.
  - Hautrive, 1295 (*App.* 44.)
- Dredging:
  - Burt (*Burt*), 26.
  - Simons & Brown, 494.
- Dress improvers. *See* "Dresses."
- Dresses and other garments; ladies' underclothing:
  - Macintosh & Boggett, 137.
  - Tombs, 493.
  - Alekan & Alekan, 1141 (*App.* 42.)
- Dressing and sizing yarns. *See* "Sizing."
- Drills, seed drills. *See* "Sowing."
- Drinks; drinking vessels:
  - Macintosh & Boggett, 137.
  - Bonneville (*Beckman-Olofson*), 376.
- Driving bands. *See* "Bands."
- Dry closets. *See* "Waterclosets."

Drying; expressing moisture:
Lyttle, 31.
Thomas, 217.
Newton (*Morgan*), 266.
Johnson, 293.
Williams, 303.
Petrie, jun., 307.
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Lake (*Hitchcock*), 405.
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Nichol & Eckersley, 455.
Lancaster & Bullough, 683 (*App.* 36.)
Culp, 1377 (*App.* 45.)
Solvay, 1525 (*App.* 47.)

Drying oils:
Ford, 223.

Dust shields for railway carriages:
Edwards (*Thornton & Buckland*), 495.

Dyeing fabrics, yarns, &c.:
Sieber & Furnevall, 17.
Lloyd, 224.
Ripley (*Depoully*), 283.
Rydill, 370.

Dyes and printing colours:
Curtis, 327.
Smith, 425.
Smith, 1802 (*App.* 51.)

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Earrings:
Ward, 289.

Earthenware and porcelain:
Newton (*Morgan*), 266.
Johnson (*Caldwell*), 340.

Earthy salts:
Clark (*Blanchard, Bang & Provost*), 388.

Easels:
Lake (*Curtis*), 1499 (*App.* 46.)

Egg beaters or mixers:
Jowett, 336.

Elastic hose stockings for horses. *See* "Medical treatment of animals."

Electric telegraphs. *See* "Telegraphs (electric)."

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Highton, 4.
Low, 33.
Baggs, 108.
Hollingworth, 229.
Clark (*D'Arlincourt*), 255.
Seymour, 288.
Johnson (*Arson*), 312.
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Bonneville (*Allen & Dewey*), 375.
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Lake (*Batchelder*), 783 (*App.* 37.)
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Barlow (*Rousseau, jun. & Cochard*), 464.

Embankments; banks:
Simons & Brown, 494.

Embossing; producing raised patterns:
Hughes, 15.
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Bayly, 319.
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Embroidering. *See* "Sewing."

Emery, sand and glass papers, ropes and cords; emery cloth:
Lake (*Hitchcock*), 405.
Edwards, 1379 (*App.* 45.)

Enamelling:
Edwards, 73.
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Baggs, 108.
Marsden, 499.

Envelopes:
Hunt (*McCrea*), 450.

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Lake (*De Voy*) 2342 (*App.* 6.)

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Extracts:
Curtis, 327.
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Eye protectors. *See* "Spectacles."

Eyelets:
Mawhinney (*Wiggin*), 1403 (*App.* 45.)

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Fabrics:
Oldroyd & Oldroyd, jun., 167.
Walker, 196.

Fall-off mechanism in spinning:
Lake (*Sutherland*), 1418 (*App.* 45.)

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Feeding bottles:
Stocker, 154.

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Johnson (*Nes*), 325.

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Smith (*Du Motay*), 2.
Toepler, 3.
Fish, 6.
Fish & Wotherspoon, 7.
Pearsall, jun. (*Pearsall*), 49.
De Negri, 76.
Hodgart (*Jones*), 88.
Madden (*Bourne*), 118.
Walker (*Sugden*), 166.
Oldroyd & Oldroyd, jun., 167.
Hughes (*De Labarre*), 191.
Walker, 198.
Ungerer, 257.
Annandale, jun., 270.
Dobson, Rushton & Dobson, 292.
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Lake (*Hitchcock*), 405.
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Lawson (*Girardini*), 625 (*App.* 35.)
Lake (*Hail*), 717 (*App.* 36.)
Lake (*Chase & Platt*), 961 (*App.* 40.)
Crighton, 1152 (*App.* 42.)

Files and rasps:
Brandon (*Weed*), 628 (*App.* 7.)

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Earl of Caithness, 48.
Fox, 201.
Curtis, 327.
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Finger protectors. *See* "Muffs."

Finishing, dressing, singeing, shearing, folding and pressing woven fabrics, yarns, &c.:
Whittaker, 132.
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Todd & Winn, 351.
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Fire-arms, guns and ordnance; gun carriages;
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Scott, 42.
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- Nitrous oxide or other gases (administering):
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- Note books. *See* "Pocket books."
- Noxious gases and vapours (arresting and preventing):
  - Clark, 27.
  - Gowans, 87.
  - Ronald & Farmer, 89.
  - Seddon, 106.
  - Simpson, 146.
  - Hollingworth, 229.
  - Carter, 465.
  - Johnson, 472.
  - Lake (*Daniels*), 1500 (*App.* 46.)
- Nuts (disintegrating). *See* "Disintegrators."

O.

- Oiling or lubricating; materials for oiling:
  - Newton (*Mettam & Sanson*), 46.
  - Lake (*Allen*), 163.
  - Clark (*Doty, Miltimore, Mickel & Mickel*), 220.
  - Lake (*Clark*), 251.
  - Smith & Coventry, 290.
  - Seyd, 368.
  - Edwards, 374.
  - Rowley, 408.
  - Benson (*Honell*), 799 (*App.* 38.)
  - Porritt, 1107 (*App.* 42.)
  - Dupré, 1541 (*App.* 47.)
  - Mills (*Bennett*), 2283 (*App.* 5.)
- Oils (animal):
  - Coffey, 64.
  - Morfit, 140.
  - Wilson, 446.
- Oils from seeds; vegetable oils:
  - Coffey, 64.
  - Morfit, 140.
  - Ford, 223.
  - Wilson, 446.
  - Platt, 969 (*App.* 40.)
- Oils of tar, mineral oils, hydrocarbons:
  - Coffey, 64.
  - Young, 413.
  - Cook & Henderson, 422.
  - Young, 459.
  - Benson (*Honell*), 799 (*App.* 38.)

Opening boxes, canisters, tins, &c.:
- Schlesinger, (*Dixon*), 98.
- Warren, 113.

Ordnance. *See* "Fire-arms."

Ores (bags for containing). *See* "Bags."

Ovens:
- Whitwell, 171.
- Box, 282.
- Jarman & Mitchell, 338.

Oxidation and incrustation (preventing and removing):
- Weeks, 141.
- Ellis & Dobson, 247.
- Friedmann, 254.
- Pigott, 286.
- Lake (*Ellsworth*), 900 (*App.* 39.)
- Smith, 921 (*App.* 39.)
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)

Oxides:
- Rowan, 476.
- Anderson, 513 (*App.* 7.)
- Weldon, 602 (*App.* 5.)

P.

Packing for steam-engines, pumps, valves, &c.:
- Fish, 6.
- Lake (*Allen*), 163.
- Betts, 355.
- Clark (*Floyd, Dieterich & Schüssler*), 901 (*App.* 39.)
- Westinghouse, jun., 1226 (*App.* 4.)
- Sullivan, 1689 (*App.* 49.)
- Mills (*Bennett*), 2283 (*App.* 5.)

Paddle wheels. *See* "Propelling ships."

Pails:
- Lake (*Shepard & Seaman*), 444.

Paints; painting:
- Morton, 96.
- Clark (*Weyde*), 149.
- Wigzell, 298.
- Sellars, 393.
- Rowan, 476.
- Bonneville (*Charton*), 1079 (*App.* 41.)

Paper, papier mâché, paper pulp (making):
- Edwards, 73.
- De Negri, 76.
- Ungerer, 257.
- Annandale, jun., 270.
- Burgess, 358.
- Sellars, 393.
- Roeckner & Lunge, 463.
- Granville, 605 (*App.* 35.)
- Platt, 969 (*App.* 40.)

Paper (application of):
- Bash, Bash & Bash, 52.
- Edwards, 73.
- Lake (*Croasdale*), 148.
- Lake (*Hitchcock*), 405.

Paper (cutting and ornamenting):
- Morton, 96.
- Lake (*Warth & Jobbins*), 536 (*App.* 34.)

Paper fasteners:
- Alekan & Alekan, 1141 (*App.* 42.)

Paper (waterproofing):
- Lake (*Morris*), 162.

Parchment:
- Lake (*Hitchcock*), 405.

Paving. *See* "Road making."

Peat:
- Box, 282.
- Monckton, 423.

Pencils:
- Johnson (*Reckendorfer*), 578 (*App.* 4.)

Perforating paper, &c.:
- Bayly, 319.

Perfuming. *See* "Scent."

Phosphates (bags for containing). *See* "Bags."

Phosphorus:
- Anderson, 513.

Photography:
- Edwards, 73.
- Clark (*Weyde*), 149.

Pickers for looms. *See* "Weaving (pickers)."

Pictures:
- Edwards, 73.

Piers; jetties:
- Page, 135.
- Saunders, 278.

Pile driving; piles:
- Smith, 921 (*App.* 39.)

Pills; administering pills:
- Sullivan, 111.

Pincers and nippers:
- Schlesinger (*Dixon*), 98.
- Boyd & Henderson, 261.

Pins; breast pins; sticking pins in paper:
- De Forest, 1564 (*App.* 47.)
- De Forest, 1565 (*App.* 47.)

Pipes, tubes and syphons:
- Fish, 6.
- Tullis, 8.
- Spence, 56.
- Healey, 85.
- Ronald & Farmer, 89.
- Kent, 90.
- Lake (*Radde*), 121.
- Lee, 128.
- Lake (*Morris*), 162.
- Burr (*Prall*), 253.
- Lake (*Myers*), 316.
- Allibon & Manbré, 318.
- Calvert & Taylor, 350.
- Lake (*Morison*), 373.
- Sutherland, 385.
- Johnson (*Buzby*), 419.
- Smith (*Michaels & Broadwell*), 477.
- Bell & Walker, 502.
- Westinghouse, jun., 595 (*App.* 4.)
- Johnson, 732 (*App.* 37.)
- Allen, 894 (*App.* 39.)
- Smith, 921 (*App.* 39.)
- Carter & Carter, 1434 (*App.* 46.)
- Lake (*Daniels*), 1500 (*App.* 46.)
- Haseltine (*Middleton*), 1801 (*App.* 50.)
- Morgan-Brown (*Houghton*), 2268 (*App.* 5.)

Pipes for smoking:
- Boger, 246.

Pistons and piston packings:
- Fish, 6.
- Caspersen (*Blair*), 28.
- Benson (*Cope & Maxwell*), 104.
- Geneste, 241.
- Lake (*Brayton*), 432.
- Porritt, 1107 (*App.* 42.)
- Westinghouse, jun., 1226 (*App.* 4.)
- Sullivan, 1689 (*App.* 49.)
- Mills (*Bennett*), 2283 (*App.* 5.)

Pivots or arbors:
- Clark, 2176 (*App.* 4.)

Planing. *See* "Cutting."

Plant labels. *See* "Horticulture."

Plants and trees (application of):
- Brandon (*De Gonzalo & Grisci*), 82.
- Ungerer, 257.
- Gardner, 491.
- Smith, 1802 (*App.* 51.)

Ploughing, tilling and cultivating land:
- Lewis, 60.
- Hill, 65.
- Noddings, 134.
- Lake (*Carter*), 992 (*App.* 40.)
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Lake (*Baxter*), 1244 (*App.* 43.)
- Porter, 1820 (*App.* 51.)
- Hyde, 2127 (*App.* 3.)

Pneumatic conveyances:
- Lake (*Radde*), 121.

Pocket and note books; pocket diaries:
- Millar, 244.
- Newton (*Gateuil*), 366.

Polishing and burnishing; polishing powders:
- Hodges, 733 (*App.* 37.)

Portmanteaus; travelling cases:
- Everickx, 260.

Postal cards:
- Hunt (*McCrea*), 450.

Posts and poles:
- Lyttle, 109.
- Hodgson, 418.

Potash. *See* "Alkalies."

Potassium. *See* "Sodium."

Pots:
- Stocker, 154.

Pottery. *See* "Earthenware."

Pouches:
- Oldroyd, 364.

Powders (administering):
- Sullivan, 111.

Precious stones. *See* "Gems."

Preserving and preparing articles of food:
- Newton (*Barre-Pin & Barre-Pin*), 37.
- Warren, 113.
- Walker, 272.
- Barlow (*Rousseau, jun. & Cochard*), 464.
- Johnson (*Enault & Co.*), 1951 (*App.* 52.)
- Lake (*Weed*), 2369 (*App.* 6.)

Preserving skins:
- Barlow (*Rousseau, jun. & Cochard*), 464.

Presses, compressing and packing:
MacDonald & Eskrett, 62.
Hodgart (*Jones*), 88.
Schemioth, 94.
Lake (*Campbell*), 169.
Walker, 196.
Bonneville (*Le Clercq*), 238.
Annandale, jun., 270.
Lake (*Clarke*), 329.
Betts, 355.
Nichol & Eckersley, 455.
Lake (*Seibert*), 525 (*App.* 34.)
Cory & Cory, 555 (*App.* 7.)
Ducomet (*Legris*), 1272 (*App.* 44.)

Printing or ornamenting book covers, &c.:
Birdsall, 382.

Printing paper; composing and distributing type:
Newton (*Hoe*), 45.
Cunningham, 55.
Edwards, 73.
Lake (*Campbell*), 169.
Bayly, 319.
McDonald, 352.
Nichol & Eckersley, 455.
Marsden, 499.

Printing woven and other fabrics and yarns:
Lloyd, 224.
Hulme & Hulme, 372.

Projectiles. *See* "Shot."

Propelling carriages; locomotion on land:
Roberts, 696 (*App.* 36.)
Lake (*Baxter*), 1244 (*App.* 43.)

Propelling machinery (feed mechanism):
Morton, 96.
Allerton, 114.
Walker (*Sugden*), 166.
Hughes (*Bates, Baker & Ferguson*), 179.
Ennor, 271.
Glasspool (*Glasspool*), 276.
Barthelmes, 291.
Johnson (*Lawrence*), 339.
Clark (*Sheffield & Mellor*), 399.
Stockwell (*Howe Machine Co.*), 401.
Notara, 439.
Lake (*Warth & Jobbins*), 536 (*App.* 34.)
Brown (*Fuller*), 950 (*App.* 40.)
Crighton, 1152 (*App.* 42.)
Mawhinney (*Wiggin*), 1403 (*App.* 45.)
Whittemore (*Landfear*), 2311 (*App.* 5.)

Propelling machinery (gauges, guides and traversers):
Newton (*Singer Machine Co.*), 489.
Lake (*Warth & Jobbins*), 536 (*App.* 34.)
Benson (*Howes, Babcock, Babcock & Ewell*), 2192 (*App.* 4.)

Propelling or driving machinery; transmitting power and motion:
Newton (*Hoe*), 45.
Lindsay, 101.
Stokes & Stokes, 156.
Hughes (*Bates, Baker & Ferguson*), 179.
Smyth, 187.
Whittingham, 215.
Newton (*Closson*), 274.
Baker, 287.
Carter, 328.
Baumann, 389.
Clark (*Edge*), 414.
Harfield, 483.
Lancaster & Bullough, 683 (*App.* 36.)
Bousfield (*Herrick*), 1016 (*App.* 40.)
Fenno & Howe, 1871 (*App.* 51.)
Lowry, 1966 (*App.* 52.)

Propelling ships; locomotion on water:
Pieper, 67.
Barker, 84.
Aston, 116.
Pieper, 153.
Leigh, 205.
Saunders, 278.
Clark (*Hédiard*), 436.
Clark (*Condell*), 437.
Hodgson, 447.
Allingham, 452.
Henderson, 514.
Warneck, 2177 (*App.* 4.)

Pulleys and pulley blocks:
Pieper, 67.
Williamson & Williamson, 497.
Low, 530 (*App.* 34.)
Lowry, 1966 (*App.* 52.)

Pulp for making paper. *See* "Paper."

Pumps; raising and pumping water and other liquids:
Fish, 6.
Benson (*Cope & Maxwell*), 104.
Lake (*Allen*), 163.
Hanscom, 181.
Gaskell, 190.
Higginson, 202.
Geneste, 241.
Burr (*Prall*), 253.
Ennor, 271.
Baumann, 389.
Sullivan, 1689 (*App.* 49.)
Morgan-Brown (*Houghton*), 2268 (*App.* 5.)
Mills (*Bennett*), 2283 (*App.* 5.)

Punching metals. *See* "Boring."

Punching or piercing leather, &c.:
Tullis, 8.
Clark (*Sheffield & Mellor*), 399.
Mawhinney (*Wiggin*), 1403 (*App.* 45.)

Purses:
Oldroyd, 364.

R.

Rags and waste:
Oldroyd & Oldroyd, jun., 167.
Gibbs & Borwick, 314.

Railings:
Hulse, 195.

Railway breaks. *See* "Breaks for carriages."

Railway carriages:
Galloway, 14.
Edwards, 374.
Titley, 386.
Woods, 430.
Edwards (*Thornton & Buckland*), 495.
Lake (*Emery, Doyen & Sparrow*), 770 (*App.* 37.)
Lynch, 1861 (*App.* 51.)
Haseltine (*Sanderson*), 2435 (*App.* 7.)

Railway ferries; transferring trains to and from floating vessels:
Kochs, 107.
Page, 135.
Leigh, 205.

Railway rolling stock (cleaning or washing):
Earl of Caithness, 48.

Railways (coupling and joining carriages):
Taylor & Larkin, 533 (*App.* 34.)

Railways (permanent way, rails, chairs and sleepers):
Spence (*Oakley*), 138.
Edwards, 297.
Johnson (*Nes*), 325.
Ireland & Ireland, jun. (*Pink*), 429.
Greener & Sarney, 438.
Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
Boone & Herman, 1590 (*App.* 47.)

Railways (points and switches):
Imray, 1354 (*App.* 5.)

Reaping; mowing; making hay:
Lake (*Sprague*), 421.
Lake (*Miller*), 481.
Haseltine (*Osborne*), 537 (*App.* 34.)
Lake (*Passmore*), 538 (*App.* 34.)

Reflectors:
Lake (*Mercer*), 120.
Keeling, 150.
Phillips, 384.
Defries, 516 (*App.* 7.)

Refrigerating; cooling; making ice:
Dufrené (*Tellier*), 228.
Walker, 272.
Johnson (*Gravenstine & Taylor*), 420.

Registering, indicating and marking apparatus:
Bañolas-Arnau, 198.
Taylor, 240.
Punshon, 347.
Lake (*Warth & Jobbins*), 536 (*App.* 34.)
Barbour, 2437 (*App.* 7.)

Regulating tension of warps. *See* "Weaving."

Resin; resinous substances:
Smith (*Du Motay*), 2.
Platt, 969 (*App.* 40.)

Retorts:
Lake (*Muller & Eichelbrenner*), 200.
Clark (*Floyd, Dieterich & Schüssler*), 901 (*App.* 39.)
Monckton, 1460 (*App.* 46.)

Reversing apparatus for machinery:
Hannay, 230.
Smith & Coventry, 290.
Schüssler & Wagner, 333.
Mills (*Bennett*), 2283 (*App.* 5.)

Ribbon looms. *See* "Weaving."

Rifling. *See* "Boring."

Road making and paving:
Lyttle, 31.
Dyne & Dyne, 170.
Stone, 203.
Hotchkiss, 207.
Whittingham, 215.
Lake (*Hotchkiss*), 345.
Lake (*Hotchkiss*), 346.
Norton, 357.
Nussey, 367.
Touche, 488.
Williamson & Williamson, 497.
Norris, 1031 (*App.* 41.)
Boone & Herman, 1590 (*App.* 47.)
Tucker, 1669 (*App.* 49.)
Parlour, 2014 (*App.* 1.)
Lake (*Smith*), 2065 (*App.* 2.)

Road steamers. *See* "Traction-engines."

- Roads and pavements (cleansing):
  - Dyne & Dyne, 170.
  - Wood, 212.
  - Sprague, 306.
  - Rosborough, 324.
- Rock drills. *See* "Boring."
- Rolling metals. *See* "Metals (rolling)."
- Roofing; roofs and domes:
  - Hyatt, 25.
  - Lake (*McLeod*), 443.
  - Lake (*Cornell*), 960 (*App.* 40.)
  - Tucker, 1669 (*App.* 49.)
- Ropes, cordage, twine, oakum, wire ropes:
  - Fish & Wotherspoon, 7.
  - Lake (*Morris*), 162.
  - Walker, 331.
- Rotary spaders or diggers. *See* "Digging."
- Rugs; mats; travelling rugs:
  - De Montoison, 12.
  - Newton (*Webster & Meserole*), 344.
  - Blundell, 353.

S.

- Safes:
  - Cottam, 458.
  - Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Sail cloth. *See* "Ships' sails."
- Sail hanks. *See* "Hanks."
- Salt (common):
  - McDougall, 311.
  - Hamer, 630 (*App.* 7.)
- Salts:
  - Coffey, 64.
  - Gibbs & Borwick, 314.
  - Weldon, 359.
  - Clark (*Blanchard, Bang & Provost*), 388.
- Saw dust and turnings (utilizing). *See* "Fuel."
- Saws:
  - Last, 285.
- Scarves. *See* "Neck-ties."
- Scent and perfumes; perfuming:
  - Doudney & Adams, 178.
- School desks and furniture:
  - Lake (*Curtis*), 1499 (*App.* 46.)
- Scissors and shears:
  - Foveaux, 74.
  - Holland, 378.
  - Smith, 395.
  - Newton (*Thompson*), 506
  - Hunt (*Wehrlin*), 1903 (*App.* 52.)
- Screens. *See* "Sifting."
- Screws; screw drivers:
  - Schlesinger (*Dixon*), 98.
  - Hughes (*Bates, Baker & Ferguson*), 179.
- Seals for locks:
  - Mills (*American Seal Lock Co.*), 252.
- Sea-sickness (preventing):
  - Dicey, 151.
- Sea-weed (treating):
  - Sellars, 100.
  - Cunningham & Corbin, 361.
- Setting tires on wheels. *See* "Wheels for carriages."
- Sewing and embroidering:
  - Hughes, 15.
  - Lake (*Mercer*), 120.
  - Smyth, 187.
  - Barthelmes, 291.
  - Carter, 328.
  - Morrall, 398.
  - Clark (*Sheffield & Mellor*), 399.
  - Stockwell (*Howe Machine Co.*), 401.
  - Hamilton, 474.
  - Newton (*Singer Machine Co.*), 489.
  - Lake (*Mills & Taylor*), 500.
  - Campion, 534 (*App.* 34.)
  - Bousfield (*House*), 710 (*App.* 36.)
  - Bousfield (*Herrick*), 1016 (*App.* 40.)
  - Lake (*Wardwell, jun.*), 2200 (*App.* 4.)
  - Laycock, 2288 (*App.* 5.)
- Shafts and shafting:
  - Baker, 287.
  - Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Shearing animals:
  - More & Norman, 139.
  - Holland, 378.
  - Smith, 395.
  - Hunt (*Wehrlin*), 1903 (*App.* 52.)
- Ship and boat building:
  - Mayler, 20.
  - Spence, 56.
  - Clark, 70.
  - Cooke, 123.
  - Newell, 142.
  - Dicey, 151.
  - Stone, 203.
  - Leigh, 205.
  - Henderson, 514 (*App.* 7.)
  - Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
  - Allen, 2034 (*App.* 1.)
- Ships' boats (lowering, raising and disengaging):
  - Mills (*Cathcart, Ezekiel & Fachtz*), 61.
  - Hill, 242.
  - Jones & Green, 1082 (*App.* 41.)
- Ships' bottoms (coating):
  - Weeks, 141.
- Ships of war:
  - Henderson, 514 (*App.* 7.)
  - Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Ships' rigging:
  - Fish & Wotherspoon, 7.
  - Townsend, 2083 (*App.* 2.)
- Ships' sails:
  - Fish & Wotherspoon, 7.
  - Lake (*Morris*), 162.
  - Low, 530 (*App.* 34.)
- Shirts; wristbands:
  - Tombs, 493.
  - Alekan & Alekan, 1141 (*App.* 42.)
  - Lake (*Keep*), 2098 (*App.* 2.)
- Shot, shell and other projectiles:
  - Russell, 227.
  - Boyd (*Wallace*), 1830 (*App.* 51.)
- Shovels. *See* "Spades."
- Shutters:
  - Hyatt, 40.
  - Titley, 386.
- Shuttles used in sewing. *See* "Sewing."
- Shuttles used in weaving. *See* "Weaving."
- Sifting; sorting; separating:
  - Ennor, 271.
  - Notara, 439.
  - Warlich, 454.
  - Musgrave & Musgrave, 505.
- Signals, alarms and communicating apparatus:
  - Highton, 4.
  - Galloway, 14.
  - Handcock, 16.
  - Garrood & Hardmet, 51.
  - Lyttle, 109.
  - Keeling, 150.
  - Lake (*Allen*), 163.
  - Wood, 211.
  - Burr (*Prall*), 253.
  - Glasspool (*Glasspool*), 276.
  - Phillips, 384.
  - Burn, jun., 440.
  - Marsh, 460.
  - Smith (*Michaels & Broadwell*), 477.
  - Westinghouse, jun., 595 (*App.* 4.)
  - Westinghouse, jun., 933 (*App.* 4.)
  - Imray, 1354 (*App.* 5.)
  - Calahan, 1537 (*App.* 47.)
  - Sullivan, 1689 (*App.* 49.)
  - Hookham, 1938 (*App.* 52.)
- Sinks:
  - Gowans, 87.
- Size:
  - Sellars, 393.
- Sizing, dressing and gumming yarns:
  - Lancaster & Bullough, 683 (*App.* 35.)
- Skates:
  - Pennell, 54.
- Sketching. *See* "Drawing."
- Skylights. *See* "Windows."
- Slaughter houses:
  - Norton, 357.
- Smoke prevention; burning and consuming smoke:
  - Kent, 90.
  - Woods, 277.
  - Jarman & Mitchell, 338.
  - Edwards & Robinson, 475.
  - Rice, 520 (*App.* 7.)
- Soap:
  - Morfit, 140.
  - Platt, 969 (*App.* 40.)
- Soda. *See* "Alkalies."
- Sodium, potassium and their salts:
  - Weldon, 359.
  - Smith, 425.
  - Anderson, 513 (*App.* 7.)
- Sowing seed:
  - Harrison, 77.
- Spades and shovels:
  - Jones, 400.
- Spark arresters:
  - Edwards (*Thornton*), 1969 (*App.* 52.)
- Spectacles; eye protectors:
  - Vale, 72.
- Spermaceti:
  - Wilson, 446.

The features of novelty which constitute this invention, are casting or embedding a steel or iron tube in a fire bar. The tube running from end to end of the fire bar and returning, having both outlet and inlet in the underside of the front of the bar. The outlet and inlet take respectively into water passages formed in a hollow front bearer. The bars are fixed to the bearer by a stud and nut. The feed water flows through one passage of the bearer and through the tubes of the fire bars, returning to the other passage of the bearer, and from thence as heated feed to the boiler.

A.D. 1872, February 28.—No. 616.

BABLON, VICTOR, of No. 40, Rue du Roi-de-Sicile, Paris, France.—"Improvements in apparatus for "measuring the delivery of gaseous, fluid, or other currents."

The object of the present invention is to instantly indicate or measure the delivery of gaseous or fluid currents.

This is effected in the following manner, the gas or other current is admitted through a tap or taps of variable orifices (to be employed at will) into a chamber, the pressure of the current in the chamber being indicated by a manometer, from thence it passes through a tap below the burner, and the pressure of supply thereto is indicated by another manometer, thus both the pressure of the current in the chamber, and the pressure of supply to the burner are both indicated by separate manometers.

A.D. 1872, February 29.—No. 631.

BRANDAUER, CHARLES HENRY EMANUEL, of Birmingham, in the county of Warwick, manufacturer.—"Improvements in metallic pens."

This invention consists in providing pens with two (or more) sets of nibs arranged side by side and at a distance apart equal to the parallel or doubled lines to be made. The upper side of the body of the pen has an ink reservoir or recess which assists in supplying ink to the two or more sets of nibs. Pens so made have a forked appearance at the front or writing end, the branches of the fork constituting the several sets of nibs described. These pens are pincipally useful in ornamental writing where the down, or up and down strokes require to be doubled or trebled, or consist of two or more parallel lines, the whole of the sets of nibs being in contact with the paper in making the doubled down and up strokes, and one set of the nibs only in making the occasional single lines of the upstrokes.

A.D. 1872, February 29.—No. 635.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Eben Moody Boynton, of Grand Rapids, state of Michigan, United States of America.*)—"Improvement in saws."

The saw teeth are made with two cutting points, with a cutting edge on each face, their outer cutting edges being inclined inward from the point. The two points of the tooth are dressed to cut on one side of the kerf, and the next cutting tooth is dressed to cut on the other side of the kerf.

Alternately with these cutting teeth are clearing teeth which remove the wood from the kerf.

A.D. 1872, April 19.—No. 1167.

CAMPBELL, JAMES, of 4, Founders Court, in the city of London, civil engineer.—"Improvements in "the mode of getting at the external bottom of ships and vessels for the purpose of cleaning, repairing, "and overhauling them."

The object of the invention is to heel over vessels and raise them on one side sufficiently to get their keels out of water, by weighting the vessel on the opposite side, which is thereby correspondingly lowered. When the vessel is heeled over, its keel and lowered side are respectively supported on blocks, and the level of the water in which the vessel floats is lowered as required by ordinary means, if in a floating dock, or by the falling of the tide if the vessel be supported on a sheltered shore with a bank prepared to receive the lowered side of the vessel.

A.D. 1872, August 19.—No. 2461.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Frank Leonard Pope, of Elizabeth, New Jersey, United States of America, electrical engineer.*)—"Improvements in electro-magnetic signalling apparatus."

Sulphur:
  Coffey, 64.
  Anderson, 513 (*App.* 7.)

Surgery; surgical instruments:
  Foveaux, 74.
  Crapper, 231.
  Jaques & Banks, 305.

Surveying instruments:
  Lake (*Biggs*), 1019 (*App.* 40.)

Sweeping roads. *See* "Roads (cleansing)."

T.

Tallies or plant labels. *See* "Horticulture."

Tanks. *See* "Cisterns."

Tanning skins. *See* "Leather."

Tape looms. *See* "Weaving."

Tapestry (imitation):
  Bonneville (*Charton*), 1079 (*App.* 41.)

Taps. *See* "Cocks."

Tar; acid tars:
  Coffey, 64.
  Johnson (*Blondin*), 103.

Teapots; obtaining infusions of tea:
  Andrew, 184.
  Curtis, 327.

Telegraphic printing:
  Clark (*D'Arlincourt*), 255.
  Rault & Chassan, 304.
  Wheatstone & Stroh, 473.
  Calahan, 2327 (*App.* 6.)

Telegraphs (electric):
  Highton, 4.
  Harling, 81.
  Robson, 86.
  Lyttle, 109.
  Lake (*Radde*), 121.
  Clark (*D'Arlincourt*), 255.
  Cockshott, 412.
  Wheatstone & Stroh, 473.
  Truman, 482.
  Calahan, 1537 (*App.* 47)

Tell-tales:
  Westinghouse, jun., 595 (*App.* 4.)

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This invention consists in the combination, with a suitable conductor of electricty constructed and adapted to be secured to and worn upon or around a person's head, of a battery or batteries for generating electricity, whereby the therapeutic effects of electro-galvanism upon the nerves of the head may be obtained in a simple, convenient, and effective manner.

A.D. 1872, August 22.—No. 2498.

BROOKES, William, of 62, Chancery Lane, London, in the county of Middlesex, patent and registration agent.—(*A communication from the Augsburger Kammgarnspinnerei, of Augsburg, in the Kingdom of Bavaria.*) —" Improvements in means for stopping the working of apparatus on the breaking or failure of thread in " the roving, spinning, or twisting of wool, cotton, or other fibres."

The invention relates to the use of an electro magnetic regulator for stopping the motion of apparatus on the breaking or failure of any of the threads in the roving, spinning, or twisting of wool, cotton, or other fibres.

A.D. 1872, August 23.—No. 2509.

HENDERSON, Thomas, of Liverpool, in the county of Lancaster, mechanical engineer.—" Improved " apparatus for supplying fuel to furnaces and for removing clinkers from the same."

The first part of my said invention relates to apparatus for automatically supplying fuel to steam boiler and other furnaces at a uniform rate of speed, and in such a manner that the fuel is evenly distributed over the entire surface of the fire-bars. I use a series of rotating blades or wings formed or secured upon a roller enclosed in a box arranged over two horizontally rotating fans, also enclosed in a box or case. A hopper or shoot brings the coal into the roller box where it is crushed by the action of the said blades or wings and falls upon the fans, which are driven by frictional or toothed pinions upon which the fan discs rest. In this apparatus there are no vertical shafts projecting above or below the fans, and the entire apparatus is very compact. The second part of my invention relates to mechanism for detaching and removing clinkers from the fire bars of furnaces. I connect some of the fire-bars with eccentric shafts to which I impart a rotary motion, whereby in connection with other contrivances the bars are operated to move up and down and forward and back in such a manner that the clinkers are detached and carried forward to a turning or tipping plate by which they are discharged.

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AND TO

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes.]

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- Johnson (*Sellers*), 59.
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  Hughes (*Baldwin*), 590.
  Benson (*Honell*), 799 (*App.* 38.)
  Porritt, 1107 (*App.* 42.)
  Dupré, 1541 (*App.* 47.)
  Mills (*Bennett*), 2283 (*App.* 5.)

Oils (animal):
  Coffey, 64.
  Morfit, 140.
  Wilson, 446.

Oils from seeds; vegetable oils:
  Coffey, 64.
  Morfit, 140.
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  Platt, 969 (*App.* 40.)

Oils of tar, mineral oils, hydrocarbons:
  Coffey, 64.
  Young, 413.
  Cook & Henderson, 422.
  Young, 459.
  Benson (*Honell*), 799 (*App.* 38.)

Opening boxes, canisters, tins, &c.:
  Schlesinger, (*Dixon*), 98.
  Warren, 113.

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Ores (bags for containing). *See* "Bags."

Ovens:
  Whitwell, 171.
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  Jarman & Mitchell, 338.

Oxidation and incrustation (preventing and removing):
  Weeks, 141.
  Ellis & Dobson, 247.
  Friedmann, 254.
  Pigott, 286.
  Lake (*Ellsworth*), 900 (*App.* 39.)
  Smith, 921 (*App.* 39.)
  Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)

Oxides:
  Rowan, 476.
  Anderson, 513.
  Rich, 547.
  Weldon, 602 (*App.* 5.)

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Packing for steam-engines, pumps, valves, &c.:
  Fish, 6.
  Lake (*Allen*), 163.
  Betts, 355.
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  Church, 563.
  Clark (*Floyd, Dieterich & Schissler*), 901 (*App.* 39.)
  Westinghouse, jun., 1226 (*App.* 4.)
  Sullivan, 1689 (*App.* 49.)
  Mills (*Bennett*), 2283 (*App.* 5.)

Paddle wheels. *See* "Propelling ships."

Pails:
  Lake (*Shepard & Seaman*), 444.

Paints; painting:
  Morton, 96.
  Clark (*Weyde*), 149.
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  Bonneville (*Charton*), 1079 (*App.* 41.)

Paper, papier mâché, paper pulp (making):
  Edwards, 73.
  De Negri, 76.
  Ungerer, 257.
  Annandale, jun., 270.
  Burgess, 358.
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  Barraclough & Barraclough, 441.
  Roeckner & Lunge, 463.
  Browne (*Count of Montebello*), 510.
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  Bash, Bash & Bash, 52.
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  Lake (*Croasdale*), 148.
  Lake (*Hitchcock*), 405.

Paper (cutting and ornamenting):
  Morton, 96.
  Lake (*Warth & Jobbins*), 536.

Paper fasteners:
  Alekan & Alekan, 1141 (*App.* 42.)

Paper (waterproofing):
  Lake (*Morris*), 162.
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  Lake (*Hitchcock*), 405.

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  Box, 282.
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  Johnson (*Reckendorfer*), 578.

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  Braudauer, 631 (*App.* 8.)

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Phosphates (bags for containing). *See* "Bags."

Phosphorus:
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Pills; administering pills:
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Pincers and nippers:
  Schlesinger (*Dixon*), 98.
  Boyd & Henderson, 261.

Pins; breast pins; sticking pins in paper:
  De Forest, 1564 (*App.* 47.)
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Pipes, tubes and syphons:
  Fish, 6.
  Tullis, 8.
  Spence, 56.
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  Ronald & Farmer, 89.
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  Lake (*Radde*), 121.
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  Lake (*Morris*), 162.
  Burr (*Prall*), 253.
  Lake (*Myers*), 316.
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  Johnson (*Buzby*), 419.
  Smith (*Michaels & Broadwell*), 477.
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  Westinghouse, jun., 595 (*App.* 4.)
  Johnson, 732 (*App.* 37.)
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  Carter & Carter, 1434 (*App.* 46.)
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  Caspersen (*Blair*), 28.
  Benson (*Cope & Maxwell*), 104.
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  Brandon (*De Gonzalo & Grisei*), 82.
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  Lake (*Baxter*), 1244 (*App.* 43.)
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  Lake (*Campbell*), 169.
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Pumps; raising and pumping water and other liquids:
- Fish, 6.
- Benson (*Cope & Maxwell*), 104.
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- Spence (*Oakley*), 138.
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- Dufrené (*Tellier*), 228.
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Resin; resinous substances:
- Smith (*Du Motay*), 2.
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Retorts:
- Lake (*Muller & Eichelbrenner*), 200.
- Porter & Lane, 588.
- Clark (*Floyd, Dieterich & Schüssler*), 901 (*App.* 39.)
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- Hannay, 230.
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- Mills (*Bennett*), 2283 (*App.* 5.)

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Road making and paving:
- Lyttle, 31.
- Dyne & Dyne, 170.
- Stone, 203.
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- Lake (*Hotchkiss*), 345.
- Lake (*Hotchkiss*), 346.
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- Johnson (*Robin & Malo*), 610 (*App.* 8.)
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- Monckton, 1460 (*App.* 46.)
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- Tucker, 1669 (*App.* 49.)
- Parlour, 2014 (*App.* 1.)
- Lake (*Smith*), 2065 (*App.* 2.)

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Roads and pavements (cleansing):
- Dyne & Dyne, 170.
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Roofing; roofs and domes:
- Hyatt, 25.
- Lake (*McLeod*), 443.
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- Moore & Moore, 586.
- Lake (*Cornell*), 960 (*App.* 40.)
- Tucker, 1669 (*App.* 49.)

Ropes, cordage, twine, oakum, wire ropes:
- Fish & Wotherspoon, 7.
- Lake (*Morris*), 162.
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Rugs; mats; travelling rugs:
- De Montoison, 12.
- Newton (*Webster & Meserole*), 344.
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Safes:
- Cottam, 458.
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Salt (common):
- McDougall, 311.
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- Coffey, 64.
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Saws:
- Last, 285.
- Clark (*Boynton*), 635 (*App.* 8.)

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Scent and perfumes; perfuming:
- Doudney & Adams, 178.

School desks and furniture:
- Lake (*Curtis*), 1499 (*App.* 46.)

Scissors and shears:
- Foveaux, 74.
- Holland, 378.
- Smith, 395.
- Newton (*Thompson*), 506
- Hunt (*Wehrlin*), 1903 (*App.* 52.)

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Screws; screw drivers:
- Schlesinger (*Dixon*), 98.
- Hughes (*Bates, Baker & Ferguson*), 179.

Seals for locks:
- Mills *Lock* (*American Seal Co.*), 252.

Sea-sickness (preventing):
- Dicey, 151.

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- Cunningham & Corbin, 361.

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Sewing and embroidering:
- Hughes, 15.
- Lake (*Mercer*), 120.
- Smyth, 187.
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- Lake (*Mills & Taylor*), 500.
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- Hughes (*Baldwin*), 590.
- Bousfield (*House*), 710 (*App.* 36.)
- Bousfield (*Herrick*), 1016 (*App.* 40.)
- Lake (*Wardwell, jun.*), 2200 (*App.* 4.)
- Laycock, 2288 (*App.* 5.)

Shafts and shafting:
- Baker, 287.
- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)

Shearing animals:
- More & Norman, 139.
- Holland, 378.
- Smith, 395.
- Hunt (*Wehrlin*), 1903 (*App.* 52.)

Ship and boat building, cleaning and repairing:
- Mayler, 20.
- Spence, 56.
- Clark, 70.
- Cooke, 123.
- Newell, 142.
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- Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
- Campbell, 1167 (*App.* 8.)
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Ships (stopping holes or leaks):
- Wood, 600 (*App.* 8.)

Ships' boats (lowering, raising and disengaging):
- Mills (*Cathcart, Ezekiel & Faehtz*), 61.
- Hill, 242.
- Jones & Green, 1082 (*App.* 41.)

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Ships' rigging:
- Fish & Wotherspoon, 7.
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- Fish & Wotherspoon, 7.
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- Garrood & Hardmet, 51.
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- Weldon, 359.
- Smith, 425.
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- Rowley, 408.
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- Fish, 6.
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- Gilmore, 29.
- Hepworth & Hepworth, 53.
- Worth, 124.
- Oldroyd & Oldroyd, jun., 167.
- Hughes (*De Labarre*), 191.
- Walker, 196.
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Reprint of leaf (pages 97 and 98) with Abridgments Nos. 435 and 441 inserted. To be substituted for the corresponding leaf in No. 7 Chronological and Descriptive Index, which was published before the Abridgments Nos. 435 and 441 could be printed.

This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. rms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where o single copies may be obtained at 4*d.* each, except the concluding number (containing the complete dexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commis-ners of Patents.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn
Friday, August 30, 1872.

CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 24 to February 29, 1872.

A.D. 1872, February 24.—No. 594.

LLIS, Alfred George, of Abbey Place, St. John's Wood, in the county of Middlesex, and **BRAD-AW**, William, of Alma Street, New North Road, in the same county.—"A certain improvement in the anufacture of cocoa fibre mats."

This invention consists in manufacturing cocoa fibre mats with colored borders entirely of fibre instead of ombination of fibre centre and woollen border as hitherto; this being effected by making the centre of mat on the "rod" principle, and the border after the manner known as "pulled up" or "tufted" work, fibre used for the border being dyed any required color.

A.D. 1872, February 24.—No. 595.

ESTINGHOUSE, George, junior, of Pittsburg, Pennsylvania, United States of America, but at present No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—"Improvements in neumatic apparatus for working brakes and communicating signals in railway trains."

This invention has reference to pneumatic brake apparatus, such as described in the Specifications to l's Patent, No. 2235, of 1870, and Westinghouse's Patents, No. 2436, of 1871, and No. 2684, of 1871, consists, firstly, in more compact and perfect constructions and arrangements of the pipes, passages, es, and reservoirs of the pneumatic apparatus; secondly, in improved mechanism, by which the running brake carriage off the line is made to act automatically upon the brakes; thirdly, in appliances to the matic apparatus whereby signals can be conveyed from one part of a train to another; and, fourthly, in mproved construction of the valve gear to the air pump engine.

A.D. 1872, February 24.—No. 596.

NS, Henry Royall, of Stapleton Road, in the city and county of Bristol.—"Improvements in metal ors."

he features of novelty of this invention consist. *First*, in stamping spaces for panels out of sheets of l of the size to form a door.

condly, forming panels with mouldings out of one entire piece of metal by stamping and connecting fixing the said panels to the spaces intended to receive them.

irdly, stiffening the front and back plates of metal doors by hooking them together at their inner sides, sing short pieces of tubing with a screw or rivet passed through each tube instead of hooks.

urthly, the use of channelled iron or strips of hoop iron for completing the edges of metal doors.

A.D. 1872, February 24.—No. 597.

PER, Tobiah, of 29, Sutherland Square, Camberwell, in the county of Surrey.—"An improved ashing machine."

he leading principle of my invention is that the repeated and alternate action of heavy but steady sure in a solvent fluid is sufficient to cleanse all kinds of textile fabrics subjected thereto.

he articles to be washed are subjected to a heavy pressure by means of metal or stone rollers, flexible or rwise, being made to roll repeatedly over them.

y machine is made in 3 different forms, each of which has a perforated false bottom, a provision for ing and boiling the water in which the linen is being washed, and surmounted with a wringing hine.

The first is a horizontal cylinder mounted to receive a semi-rotary motion, which causes a heavy roller inside to roll repeatedly over the linen, and thus to press the solvent fluid so thoroughly through it as to cleanse it from all soil and grease.

The second is a straight trough, stationary, in which a heavy roller is drawn repeatedly over the linen by means of a cord or band passing through the roller and attached to an axle at each end of the trough upon which it is alternately wound, and thus the roller is repeatedly drawn from end to end of the machine.

The third is a circular trough, also stationary, with a fixed central shaft upon which a hollow shaft is driven by wheel and pinion, carrying radiating arms, to which two or more heavy rollers are attached by a cord or band passing through them, and by the revolutions of this shaft the rollers are repeatedly drawn round the trough, while their full weight is freely pressing the solvent fluid through the linen beneath them.

Thus the process of washing by my improved machine in either form is simple, effective, complete, and free from injury. The linen placed therein being thoroughly washed, boiled, rinsed, and blued without being lifted out of the machine.

A.D. 1872, February 24.—No. 598.

AYRTON, Francis, of Liverpool, in the county of Lancaster, gentleman, and **BROWN, Samuel Shaw**, of the same place, manufacturer.—" Improvements in looms for weaving."

First. Open ended metal healds of unequal lengths at their upper terminations are fixed in bars and used to facilitate " threading " and division of the warp threads. Up and down motion is given.

Second. The spaces between the open ended metal healds are made of unequal depths to ensure proper lifting of the warp threads during upward motion.

Third. Two of the free ended metal healds are cast in a metal socket formed with a side separating piece for convenience in repairing.

Fourth. The series of free ended metal healds of unequal lengths and with spaces of unequal depths are secured in groove bars by pinching or clamping screws.

Fifth. The thread harness is dispensed with and two or more healds with the above improvements or with the first and second only are caused to move up and down in guides by adjustable vibrating stems actuated by adjustable levers receiving motion from tappets or cams on the picker or other revolving shaft. The warp threads are moved by the said two or more healds.

Sixth. The thread harness is dispensed with and the warp thread raised and lowered by a series of staple like healds, preferably cast n separate socket pieces secured in a bar or bars to which up and down motion is given.

A.D. 1872, February 26.—No. 599.

WEEKES, Charles, of Worcester, in the county of Worcester, civil engineer.—" Improvements in " carriages for common roads."

The novelty in this case consists of mounting wheel-carriages on, or attaching thereto, double sets of wheels, one set running within, and upon the rim or flange of, the other.

A.D. 1872, February 26.—No. 600.

WOOD, John William, of Harwich, in the county of Essex.—" A new or improved apparatus or appliance " for stopping holes in ships, boilers, and other vessels or objects."

A flat bar, long enough to cross the hole perpendicularly with a slit to half its length, is jointed in the centre to a threaded bolt. The flat bar, being passed through the aperture to be stopped, falls by its own weight across the outside of the aperture. A plate is then passed over the threaded bolt, and a nut on the bolt is screwed up tightly against the side.

A.D. 1872, February 26.—No. 601.

COPEMAN, Edward Stephens, of Norwich, in the county of Norfolk, gentleman.—" Improved " apparatus for communicating between the several parts of railway trains."

This invention consists in the combination and arrangement of spring wheels, cords, and bells by means of which the guard's breaks or vans, carriages, and engines, are placed in a state of intercommunication with each other.

A.D. 1872, February 26.—No. 602.

WELDON, Walter, of 29, The Cedars, Putney, in the county of Surrey.—"Improvements in treating "and applying dilute chlorine."

Converting dilute chlorine into strong chlorine by treating four equivalents of dilute chlorine by two of milk of lime, so as to produce two equivalents of chloride of calcium and two of free hypochlorous acid, and then treating that product with hydrochloric acid; or by similarly treating the dilute chlorine by certain other oxides, or by certain salts, and treating the product by either hydrochloric acid or a metallic chloride.

A.D. 1872, February 26.—No. 603.

KING, Robert, trading under the style or firm of Tupper and Company, of Birmingham, in the county of Warwick, galvanized iron manufacturers.—"An improved portable closet or privy receptacle for sanitary "purposes."

The novelty of this invention consists in forming or applying an inner curved rim below the top edge proper of the vessel or receptacle for the rim of the cover to drop into, the said inner curved rim being formed with openings for any flush of fluid to flow back, by which means such sanitary vessels may be moved about more readily when filled.

A.D. 1872, February 26.—No. 604.

HAGGART, Alexander McCallum, of Lochaline, in the county of Argyle, North Britain.—"Improvements in envelopes."

The feature of novelty which constitutes this invention is the strengthening of the corners of the envelopes by having several folds of paper at these portions, and the employment of the thread attached as described for opening up the envelopes.

A.D. 1872, February 26.—No. 605.

GRANVILLE, Charles Wedderburn, of Cecil Street, Strand, in the county of Middlesex, engineer.—"An improved process and machine for making paper-pulp from wood."

My invention relates to a novel process and machine for making paper pulp from wood without boiling the fibres or submitting them to any chemical treatment. For this purpose I subject the wood to the continuos action of cutting knives or blades, formed, arranged, and operated in such a manner that the fibres are completely separated, torn, and reduced to pulp, which is conducted away as it is produced by a stream of water to a strainer or other receptacle.

A.D. 1872, February 26.—No. 606.

VANEL, Sylvestre Theodore, of Paris, in the French Republic, gentleman.—"A new composition and "process for waterproofing all sorts of tissues, linen, paper, and other materials.

This waterproofing composition is composed of a mixture of sulphate of potash and of alumina with stearic, margaric, or other fatty acid, or of oxyde of iron and alumina, or again, of chloride of tin or acetate of lead and stearic or margaric acid. Oleic acid may also be used and marseilles or other soap of like nature.

The material to be waterproofed is passed several times through a bath prepared with the above composition, and when withdrawn the moisture should not be wrung from it, but it should be dried before a fire or in a drying atmosphere.

Previously to waterproofing woven fabrics they should be treated with a mordant composed of alum, soda-salts, and cream of tartar.

A.D. 1872, February 26.—No. 607.

BLUNDELL, Thomas, BLUNDELL, George Thomas, and **BLUNDELL, James Walter**, all of Limehouse, in the county of Middlesex, engineers and coppersmiths.—"Improvements in the construction "of waterclosets, and in the mode and means of regulating the supply of water to their pans."

These improvements relate to those waterclosets which have two valves in the passage from the pan to the soilpipe, and consist,—Firstly. In so arranging the lower valve, its seat, and spindle, that they can be easily put in their place or removed without having to take the whole closet to pieces. Secondly. In arranging the cock or valve through which the water passes to flush the closet, so that the said valve is opened or closed by the movement of the lower valve in the passage to soil pipe. Thirdly. When a valve having an india rubber surface is used to regulate the supply of water for flushing the closet, and the said closet is placed on board ship, or in such other position that salt or sea water has to be used for flushing, the seat of this said valve is made of lead or other substance that will resist the combined chemical action of the salt water and india rubber: and vice versa, when the seat of the valve is of india rubber, the valve is made of lead or other substance, excepting glass or wood, not acted upon chemically as aforesaid. The seat of this valve and the receptacle for the seat are formed so that the seat can easily be removed for inspection or replacement.

A.D. 1872, February 26.—No. 608.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Dana Bickford, of the city, county, and state of New York, United States of America.*)—"Improvements in knitting machines."

This invention relates to a circular knitting machine, and consists principally,—

In a new arrangement of the knitting needle whose latch when opened will be closed by the loop itself that has been slid over it, so that the loop may be slipped over the needle, thereby dispensing with a separate latch closer.

Also in notching the needle shank below the latch so that it can be elevated out of action by the yarn.

Also in a novel arrangement of cams for regulating the knitting action of the needles, whereby the machine may work in either direction and back and forth instead of continuously around for making flat instead of tubular fabrics.

Also in a novel arrangement of perforated base with stops to limit the action of the machines to any number of needles according to the width of the flat fabric required.

Also in a new general arrangement of parts constituting the machine proper, and consisting principally of a stationary needle cylinder having needle grooves enlarged at their upper parts and surrounded by a rotary cylinder carrying the cams, a jointed ring to prevent the removal of the needles, and a sliding ring to carry the yarn carrier.

Also in the use of new instruments for applying, suspending, and stretching the yarn, and for winding the same; and also in a new "tufting" instrument, all as more fully described in the Provisional Specification.

A.D. 1872, February 26.—No. 609.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Julia Ann Wills, of Vergennes, county of Addison, and Lucy Segar Kingsland, of Burlington, county of Chittenden, both in the state of Vermont, United States of America.*)—"Improvements in "machinery for finishing horse shoe nails."

The invention relates to machinery for hardening and finishing horse shoe nails, in which the guide of a feed screw, used to conduct the nails to the pusher for delivery to the dies, is arranged to change the nails from a vertical to a horizontal position, so that they can be delivered to horizontal dies, this result being obtained by the combination of a scroll shaped or approximately scroll shaped guide with the feed screw. Also to the arrangement of the pusher, roller die, and operating devices therefor, in such manner that the nail will be pushed forward when the roller die is over the bed die.

A.D. 1872, February 26.—No. 610.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Theodore Robin and Anne Antoine Léon Malo, both of Paris, in the Republic of France.*)—"Improvements in constructing asphalted roads, and in apparatus employed therein."

According to this invention it is proposed to employ rock asphalte, either pulverized or simply crushed, and either natural, as found in mines, or factitious, that is to say, white stone artificially impregnated with bitumen.

This rock may be employed either in a heated state or cold, the latter alternative constituting one of the most novel points in this invention.

The rock is compressed by means of a steam roller of sufficient weight to effect a compressing force of from 9 to 12 cwt. per square inch.

In asphalting a street, rails are laid down longitudinally about a yard part, the inner faces of such rails being smooth and vertical. Between these two rails there is laid a bed of crushed or pulverized asphalte, which is carried up to about three inches above the level of the rails. A roller is then passed over the rails; a projection which is formed on the central portion of the roller, of a width corresponding to the width between the rails, compresses the asphalte to the extent of the whole depth of this projection, say, for example, about 3/8ths of an inch. When this roller has arrived at the end of its traverse, the rails are replaced by others about 3/8 of an inch less in height, and the roller is passed over the asphalte again, thus compressing the bed of asphalte to the extent of 3/8ths of an inch more, and so on in succession, until the compression being completed the roller bears on the asphalte only without touching the rails.

A.D. 1872, February 26.—No. 611.

ELLIS, Robert Joseph, of Liverpool, in the county of Lancaster, engineer.—"An improved tubular fire "bar and connecting bearer for furnaces of steam and other boilers."

The features of novelty, which constitute this invention, are casting or embedding a steel or iron tube in a fire bar; the tube, running from end to end of the fire bar and returning, having both outlet and inlet in the underside of the front of the bar. The outlet and inlet take respectively into water passages formed in a hollow front bearer. The bars are fixed to the bearer by a stud and nut. The feed water flows through one passage of the bearer and through the tubes of the fire bars, returning to the other passage of the bearer, and from thence as heated feed to the boiler.

A.D. 1872, February 26.—No. 612.

CHASE, William Henry, of the city and state of New York, United States of America, now of No. 8, Southampton Buildings, London.—"An improved lever apparatus for moving carriages and trucks on "railways."

My invention relates to a simple but highly efficient and durable apparatus designed as a substitute for the ordinary crowbar or pinch-bar for moving railway carriages, trucks, or wagons upon the rails in and about stations or depôts. The said apparatus may be applied either to the wheel or the end of a carriage or wagon, and may be used between two carriages or underneath the same; it is equally advantageous on either a flat rail or a T rail; it is self adjusting to all irregularities; it will not slip backward thereon under pressure; and it can be effectually used when the rail is covered with grease, snow, or ice when the ordinary pinch-bar is entirely useless.

A.D. 1872, February 26.—No. 613.

WALKER, William, of Gate Head Mill, Greetland, in the parish of Halifax, in the county of York, india rubber manufacturer.—"An improved packing for stuffing boxes."

In constructing ring packing according to my invention I employ linen, cotton, or other fabric within which I enclose strips or bands of cork forming concentric rings of linen or fabric and of cork. The ordinary brass gauze is employed, or perforated sheet brass may be applied as interior lining for the packing.

"Rope packing" is made in accordance with this invention by enclosing strips of cork within linen, cotton, or other fabrics.

A.D. 1872, February 26.—No. 614.

ABBOTT, Otho Giles, of Huddersfield, in the county of York, Secretary to the Huddersfield School Board.—"Improvements in school desks, which are applicable to other purposes."

The end frames are constructed symetrical, that is, each end is uniform on each side of a central vertical line, and both the desk and seat parts are provided with axes or pivots which are hinged or capable of turning in holes formed in the central part of the end frames. The said desk and seat are made both sides alike, so that when turned over or reversed remain the same or equal for use. The frames are provided with supports for the seat and desk which may be either fixed or portable, which may be in a series of holes and pins or notches and catches, so as to effect any desireable or suitable position or inclination thereof. In order to convert the said desk into a seat for adults the desk part is simply turned on its axis into a vertical position or to any desireable incline, and secured by pin or catch; it then forms a back to the usual seat, and this seat may be arranged to front in either direction.

A.D. 1872, February 26.—No. 615.

REILLY, James, of the New Globe Chair and Cabinet Works, Barrack Street, Hulme, Manchester, in the county of Lancaster.—" Improved arrangements for communicating between the passengers, guards and " engine drivers of railway trains."

One arrangement of this invention consists in employing for each train a continuous length of cord passed through horizontal holes in flanged pulleys above the compartment of the carriages, the ends of the cord being connected to the arms or bodies of the guard and engine driver or to the handles of steam whistles or other well known alarums; and, when a pulley is turned by a passenger, the cord is tightened, and the signals are given.

In other arrangements the cord is passed through eyelets fixed to the sides of the carriages or formed in rods fitted in bearings in the sides of the carriages, so that by pulling the cord itself or one or other of the rods the slack of the cord can be pulled up and give the signals; and a similar cord and connections are used to signal the guard and driver, if by the breakage of a coupling or other cause the train should be parted asunder.

A.D. 1872, February 28.—No. 616.

BABLON, Victor, of No. 40, Rue du Roi-de-Sicile, Paris, France.—" Improvements in apparatus for " measuring the delivery of gaseous, fluid, or other currents."

The object of the present invention is to instantly indicate or measure the delivery of gaseous or fluid currents.

This is effected in the following manner, the gas or other current is admitted through a tap or taps of variable orifices (to be employed at will) into a chamber, the pressure of the current in the chamber being indicated by a manometer, from thence it passes through a tap below the burner, and the pressure of supply thereto is indicated by another manometer; thus both the pressure of the current in the chamber and the pressure of supply to the burner are both indicated by separate manometers.

A.D. 1872, February 28.—No. 617.

YOUNG, James, of Kelly, in the county of Renfrew, North Britain.—" Improvements in treating hydro- " carbons."

The feature of novelty which constitutes this invention is the treatment of that class of hydrocarbons known as paraffin oils with muriatic acid; the oils are heated and the muriatic acid, either liquid or aqueous, is brought in contact with the oils during agitation by agitators or dashers in proper vessels.

A.D. 1872, February 28.—No. 618.

YOUNG, James, of Kelly, in the county of Renfrew, North Britain.—" Improvements in apparatus for " obtaining hydrocarbons from shale, coal, or other similar substances."

The feature of novelty which constitutes this invention is the combining with the distilling kilns or furnaces a tower or chamber containing coke or other material, between the spaces of which the vapours, gases, and oils pass, and the use of a condenser between the tower and distilling kiln for condensing portions of the hydro-carbons.

A.D. 1872, February 28.—No. 619.

TOFT, Charles, of Gravelly Hill, in the county of Warwick, modeller.—" An improved balance cover for " hot water jugs and other covered vessels of a similar description."

The object of this invention is to provide a self acting balance cover for the vessels referred to in the title, of a simple and inexpensive description; and this I achieve by forming a cover of a size and kind adapted to the top of the vessel to which it is to be applied, and causing the same to be evenly balanced over the said top or aperture by being suspended in opposite sides of the vessel by means of a pin running across the centre of the lid and cemented thereto, the two ends or extremities of the said pin constituting together the axis upon which the lid works.

It will be understood that a suitable recess is formed in each side of the vessel for the extremities of the said pin to take in; and by preference these recesses or bearings are made in a slightly oblique direction towards the lip part of the jug, so that when liquid is poured from the jug the cover may not fall off.

A.D. 1872, February 28.—No. 620.

WASHBURN, NATHAN, of the state of Massachusetts, of the United States of America.—" Improvements " in cast metal and steel tired wheels for railway carriages and in the manufacture of such wheels and in " apparatus therefor."

The nature of the invention may be stated to consist as follows :—

First. In the mode or process described of making the cast metal wheel with a steel tire or reinforce, such consisting in introducing the fluid metal or cast iron into the mould simultaneously through a series of sprues arranged around the mould and close to the tire or reinforce, heated to redness or such a temperature as will cause the cast metal to weld or join to the tire.

Second. In a cast metal and steel tired wheel made without the use of a flux on its reinforce or tire and with the molten metal cast into the mould simultaneously through a series of sprues arranged around in the mould and at or close to the reinforce or tire.

Third. In the mould as made with a cavity for holding the reinforce or tire and with a matrix for casting the body, and also with a series of sprue holes, radial ducts, and central receiver.

Fourth. In a wheel consisting of a steel tire and also of a cast metal or iron body cast into and against the tire while the latter may be in a heated state, such as will cause the tire and the cast metal body to unite or weld together.

A.D. 1872, February 28.—No. 621.

THOMPSON, JAMES, of Napier Street, Sheffield, in the county of York.—" Improvements in the lids or " covers of vegetable dishes and other similar articles."

My improvements consist in making the lids or covers of vegetable dishes in one, two, or more parts, and so arranging the same that by means of a thumb lever may be opened at once presenting to the view a variety of vegetables at one and the same time, but each one seperate and distinct).

A.D. 1872, February 28.—No. 622.

HAMMOND, HENRY WOODCROFT, 27, Southampton Buildings, Chancery Lane, London, engineer.—(*A communication from Pierre Joseph Petot and Nicolas Salmon, two persons resident at Paris, in the Republic of France.*)—" An improved awning or covering for vehicles and other purposes, and means for working the " same."

In this invention the cloths or awnings applied as velum or shelter for passengers or goods, are mechanically developed or rolled round a special roller, by means :—1st, of bolts sliding vertically in grooves, and of connecting-rods joining together the said bolts and the rods, to which are fastened the exterior edges of the awnings ; 2nd, of pulleys keyed upon the axis of the awnings-roller, and of a rope or chain fastened in a point to the bolt and passing round another loose pulley, the whole being so disposed that by lowering the bolts in their grooves the roller wrap the awnings and conversely by the ascension of said bolt the roller unwrap the awnings which rigidity when developed is secured by the connecting rods and stop-pieces introducing themselves in a staple made into the bolt; 3d, by the application to the edges of the awnings of buttons in the form of olives, set in at once with an eyelet or guide; by introducing those buttons into fixed button-holes of a corresponding form, an turning, the tie is obtained.

A.D. 1872, February 28.—No. 623.

ROBERTS, WILLIAM, of Bootle, in the county of Lancaster, venetian blind manufacturer.—" An im- " proved machine for painting laths for venetian blinds, and other purposes."

Consists in applying paint or varnish to laths by passing the same through a pair of rollers having indentations or grooves cut in their faces, the paint being supplied from a trough beneath the rollers by a pair of discs having bucket grooves cut on their edges, and is worked through the paint or varnish.

The laths on leaving the rollers pass between stationary and adjustable brushes placed between vertical antifriction guide rollers, on leaving which the lath is completely coated, when it is removed by hand or otherwise and placed to dry.

A.D. 1872, February 28.—No. 624.

SMITH, GEORGE HAND, of the city and state of New York, United States of America, now of No. 8, Southampton Buildings, London, gentleman.—" Improvements in metallic alloys and in their application " to iron surfaces for preventing the corrosion of the same."

The object of my said invention is the protection of iron surfaces from corrosion. This object is accomplished by applying to the metal an alloy which is electro-positive to the iron, so that the latter is saved at the expense of the alloy. I use an alloy composed of two metals, one of which is electro-positive, and the other electro-negative to the iron; these two metals are combined in such proportions that the alloy is electro-positive to the iron, but only to such an extent that the destruction of the said alloy will proceed so slowly as to be practically of no importance, and, while complete protection is afforded to the iron, the alloy when once applied to the same will not require renewal for a very long time.

A.D. 1872, February 28.—No. 625.

LAWSON, FREDERICK WILLIAM, mechanical engineer, of Leeds, in the county of York.—(*A communication from Antone Girardoni, of Simmering, Vienna, Austria.*)—" Improvements in batching jute."

The claim to this Complete Specification is batching jute with a mixture of oil and water blended by means of alkali substantially as described.

A.D. 1872, February 28.—No. 626.

GEDGE, WILLIAM EDWARD, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Auguste Salmon, of Nîmes, Gard, France, merchant.*)—" Improved machinery " or apparatus for manufacturing manure and the production of ammonia."

This invention consists mainly in the use of closed boilers, a screw passing through each boiler; this screw being so arranged that at each revolution a portion of the excrement or other matter to be treated is introduced into the boiler at one end and an equal portion ejected at the other.

The ammoniacal and other gasses pass off through a pipe on the top of each boiler during the passage of the matters through it, and are collected in suitably prepared tanks.

A.D. 1872, February 28.—No. 627.

MINNS, HENRY ROYALL, of Stapelton Road, in the city and county of Bristol.—" Improvements in the " construction of tramways and railways, and in the wheels of vehicles used thereon."

The features of novelty of this invention consist—*First*, in using double chairs to support rails, and in fixing the said chairs on base plates. *Secondly*, in making holes at distances apart equal to each length of rail, and running concrete therein to form a solid bottom. *Thirdly*, making a recess on one edge of each rail, to receive the flanges of the wheels of the carriages. *Fourthly*, making oblique notches across the surface of tramway rails for a foot-hold for horses. *Fifthly*, making a split rail or two rails to leave space to receive the flanges of the wheels, and making the said flanges around the centre of the width of the tires of the wheels, to enable them to roll over the edges of rails and also to retain the wheels more securely on the rails. *Sixthly*, adapting a spring shoe or scraper over the rails to remove obstructions and scrape the surface of the rails, the said scrapers being capable of being raised and lowered at will.

A.D. 1872, February 28.—No. 628.

BRANDON, ALEXANDER HORACE, of 13, Rue Gaillon, Paris, France, civil engineer.—(*A communication from Alfred Weed, a person resident at Boston, Mass., United States of America.*)—" An improved machine " for cutting files."

The object of this invention is to make the feed of the file contingent upon the character of each tooth cut, by making the tooth itself or the spur raised behind the cutter by its blow an agent in the feed.

A.D. 1872, February 28.—No. 629.

PIDGEON, DANIEL, and MANWARING, WILLIAM, both of the Britannia Iron Works, Banbury, in the county of Oxon, engineers.—" Improvements in reaping machines."

This invention consists in two methods of giving to the revolving rakes of automatic reaping machines two paths whereby the rake at the pleasure of the operator can be made to discharge a sheaf or pass over the grain on the platform without discharging it at each revolution.

A.D. 1872, February 29.—No. 630.

HAMER, William, of the Hill, Winnington, Northwich, in the county of Chester, salt-proprietor.—"Improvements in apparatus employed in the manufacture of salt."

This invention relates to the salt-pans used in the manufacture of salt, and consists, firstly, in covering the said pans and leading the steam rising therefrom below other pans.

Secondly, in employing a mechanical agitator to cause the subsidence of the salt crystals.

And lastly, in discharging heated air into the space enclosed by the cover of the salt-pan.

A.D. 1872, February 29.—No. 631.

BRANDAUER, Charles Henry Emanuel, of Birmingham, in the county of Warwick, manufacturer.—"Improvements in metallic pens."

This invention consists in providing pens with two (or more) sets of nibs arranged side by side and at a distance apart equal to the parallel or doubled lines to be made. The upper side of the body of the pen has an ink reservoir or recess which assists in supplying ink to the two or more sets of nibs. Pens so made have a forked appearance at the front or writing end, the branches of the fork constituting the several sets of nibs described. These pens are principally useful in ornamental writing where the down, or up and down strokes require to be doubled or trebled, or consist of two or more parallel lines, the whole of the sets of nibs being in contact with the paper in making the doubled down and up strokes, and one set of the nibs only in making the occasional single lines of the upstrokes.

A.D. 1872, February 29.—No. 632.

KENWARD, Edward, of Manor House, Winterbourne, Stoke, in the county of Wilts, farmer.—"Improvements in ploughs."

This invention is designed to more completely cut or break up and lay the ground in order to prepare better seed beds than are produced by ploughs of the ordinary construction, for which purpose the plough is provided with a sharp-edged cutting wheel or disc and an adjustable drawing plate or spreader for drawing the earth from the cutting wheel or disc and spreading it as required.

A.D. 1872, February 29.—No. 633.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 35, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from J. S. Bolette, of Pepinster, in the Kingdom of Belgium.*)—"Improvements in dividing and stripping apparatus applicable to carding engines."

The invention consists in the employment of circular cutters, with or without teeth, for dividing the main sliver into a number of small strips or fillets. When plain circular cutters are employed they are arranged back to back on two shafts, so as to act in pairs and form as it were rotary shears.

The small strips or fillets are conducted to two sets of "rubbers," in one case by means of two sets of stripping rollers, one of which is fixed on their axis and the other provided with large holes and working loosely on the same axis and rotating in the opposite direction to the fixed rollers. In the other case two sets of loose stripping rollers are employed, one set being mounted on the axis of the upper set of rotary cutters, and the other set on the axis of the lower set of rotary cutters, so as to direct one half of the small slivers to the upper set of "rubbers," and the other set of small slivers to the lower set of "rubbers."

Instead of these loose stripping rollers fixed scrapers may be employed to direct the small slivers in the required direction.

A.D. 1872, February 29.—No. 634.

WALLACE, John, of 16, Grove Villas, Grove Street Road, S.E.—"Improvements in apparatus for burning gas to produce heat."

This Provisional Specification describes an arrangement, for mixing air with gas previous to burning, which consists of a drum, in the cover of which are the burners, and into which the gas is admitted through a series of cones placed base outwards in a line, and allowing the air to enter between them.

A.D. 1872, February 29.—No. 635.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Eben Moody Boynton, of Grand Rapids, state of Michigan, United States of America.*)—"Improvement in saws."

The saw teeth are made with two cutting points, with a cutting edge on each face, their outer cutting edges being inclined inward from the point. The two points of the tooth are dressed to cut on one side of the kerf, and the next cutting tooth is dressed to cut on the other side of the kerf. Alternately with these cutting teeth are clearing teeth, which remove the wood from the kerf.

A.D. 1872, February 29.—No. 636.

MORGAN, WALTER, of Liverpool, in the county of Lancaster.—" Improvements in baskets specially " applicable to coaling ships and vessels."

Baskets suitable for the above-mentioned purposes require to be of considerable strength, and the usual materials used for the construction of baskets have not been found strong enough, hence other materials have been tried, and a basket or open box of metal has been substituted but without proving altogether satisfactory. Now by my invention I construct the main framework of strong canes (preferring not to split them) and bind and secure these together (according to the practice of basket work) by means of twigs or other material, so as to form a strong basket which is well adapted for the above purposes.

A.D. 1872, February 29.—No. 637.

HANNA, DANIEL, of Belfast, in the county of Antrim, Ireland, civil engineer.—" Improvements in sewing " machines."

Performing hem stitch, herringbone, and other needlework by improvements and additions to the ordinary Thomas sewing machines and other sewing machines performing similar work, by the use of a moveable shuttle box and moveable needle arm or slides; and also by driving the machine by mechanical means of what is commonly called clock work, in order to secure evenness and equality of motion to the machines.

A.D. 1872, February 29.—No. 638.

WILSON, JOSEPH, finisher, and **LENDRUM, GEORGE**, manufacturer, both of Huddersfield, in the county of York.—" A new and improved method or means of finishing woollen cloth."

The cloth is first pressed by ordinary means and placed on rollers and steamed and afterwards washed out in hot water.

The cloth is then cut and further pressed as before, again steamed on rollers, and lastly placed on wood rollers and boiled in water in the usual way.

A.D. 1872, February 29.—No. 639.

HUGHES, EDWARD THOMAS, of the firm of Hughes & Son, patent agents, 123, Chancery Lane, London.—(*A communication from Jacob Folkmann and Ferdinand Kölgen, of Vienna, in the Empire of Austria.*) —" Improved arrangements for rapidly and effectively destroying snow and ice in the streets, public places, " court-yards, and other localities."

On the main conduit of gas and at convenient distances, according to the situation and locality, we apply branch or service pipes, on which we screw hoses of india-rubber, leather, or any convenient elastic material, one end of the hose having a screw in order to be screwed upon the branch pipe, and at the upper end of the hose there is a metal tube three feet long and furnished with a valve.

This metal tube serves as a handle to the workman for directing the jet of gas, as well as for augmenting and reducing the pressure of gas, and, for instance, by stopping the jet, and a perforated cylinder, forming the gas-burner, is screwed on the mouth of the said metal tube.

When the jet is lighted it is applied by the workman to the snow or ice, which is transformed to water, which flows easily off into the gutters or sewers.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 24 to August 30, 1872. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1872, March 1.—No. 644.

SAUNDERS, John Brewer, of Taunton, in the county of Somerset, telegraph engineer.—" Improvements " in and connected with electrical instruments for signalling on railways."

This invention refers to block signal instruments, whereby the dial is made to shew whether an up or a down train is approaching or not, in addition to the usual signal.

A.D. 1872, March 1.—No. 645.

BLACKBURN, William, of the city of Manchester, in the county of Lancaster.—" Improvements in the " construction of standards or supports for seats and desks or tables for school and other purposes."

This invention consists :

1stly. In constructing the shafts or upright portions of the standards or supports of wrought iron pipes or tubes, on to which are cast solid iron base plates and top pieces, the supports for the desks and seat boards being either joined together by the baseplates, or arranged as separate and independent stands applicable to all desks and fittings where cast iron standards are now used.

2ndly. In a simple arrangement of parts whereby the desk board or table top can with the greatest ease be securely fixed at various angles on either side of the standard supporting it, for the purpose of forming either a sloped writing desk, a drawing desk, a flat table, or a seat back, thus affording increased facilities for the arrangement of the fittings in the various positions in which they may be required to be used.

A.D. 1872, March 1.—No. 649.

MARSDEN, Henry Rowland, of Leeds, in the county of York, engineer.—" Improvements in stone " breaking machines."

This invention consists of a peculiar combination and arrangement of vertical rocking lever and front and back toggles for actuating the moveable jaw of a stone breaking machine. Also of certain combinations of steam engines with the improved stone breakers, whereby such machines may be driven direct in lieu of from driving pulley. In order to reduce the friction on the ends of the toggles next the vibrating lever, they are made with teeth which gear into other teeth in the boss of the lever.

A.D. 1872, March 4.—No. 662.

FITZPATRICK, Bernard, of Sheffield, in the county of York.—" Improvements in apparatus for clipping " horses and other animals."

There are two combs, each about the fourth of a section of a circle, the teeth parallel. The bottom comb is flat and stationary, the top comb working upon a centre, and the clip is thus given like a pair of scissors.

A.D. 1872, March 7.—No. 698.

GLOVER, Henry, of Brooklyn, in the state of New York, United States of America.—" Improvements in " local magnetic attraction indicators."

This invention is intended to indicate and so to ascertain the local attraction, so that in reckoning with the ordinary compass the local attraction may be allowed for. There are two needles or magnets, one swinging, the other fixed but adjustable; the variation is indicated by the swinging needle equal to the variation to which a compass is exposed under like circumstances.

A.D. 1872, March 22.—No. 867.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, engineer.—"Improvements in poles for telegraphic and other purposes."

The features of novelty are,—

Firstly. The employment, for telegraphic and other posts, of cast iron, whether ordinary or malleable in a form not tubular, but of such sectional shape as combines great rigidity with facility of moulding and does not require to be cored in casting; such for instance as angle, **T**, or "double-headed" bar iron.

Secondly. The attachment together of the several pieces composing the pole by means of wide flanges with or without fish plates, and the strengthening of the poles when such is needed, by means of rod iron bracings converting it into a bow-sprit girder.

A.D. 1872, August 24.—No. 2517.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Albin Warth, a person resident at Stapleton, state of New York, and William Frederick Jobbins, a person resident at the city and state of New York, United States of America.*)—"Certain improvements in "machines for cutting textile and other materials."

The invention consists in the combination of a mechanical feed with a knife and a knife carrier, and other various mechanical contrivances in such a manner that the knife is fed automatically towards the material to be cut.

A.D. 1872, August 26.—No. 2535.

HUCH, Edward Heinson, of Brunswick, in the Empire of Germany, now residing at Klein's Hotel, No. 44, Finsbury Square, in the city of London.—"Improvements in apparatus for cooking and for making "coffee and other infusions."

The claims to this Complete Specification are,—

1. The construction of cooking pots with lids, which are rendered air and steam tight by dipping into water or other liquid, and which are able to rise and fall with the pressure of the steam beneath them, and in so doing give motion to instruments which regulate the flame beneath the pot, substantially as described.

2. The construction of pots for making coffee and other infusions in such manner that when the pressure of the steam raises the water from a lower to an upper vessel the water acts upon a float, and in so doing gives motion to instruments which extinguish the flame, substantially as described.

A.D. 1872, August 26.—No. 2537.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Alfred Goddard and Alfred Edward Goddard, both of Essex, Connecticut, United States of America.*)—"An improved machine for making screw-taps."

This invention has for its object the formation of the threads on tools known as screw-taps in combination with the requisite degree of "relief" necessary in such tools, and this object is accomplished by cutting the threads automatically by a series of cutters successively presented to the blank. The frame of the machine is similar to an engine-lathe. Mounted upon said frame is a head stock and tail stock. Upon suitable guides is mounted the tool-rest. The tool-rest is properly composed of a series of sliding blocks fitted one upon the other. Upon the upper one of these blocks suitable bearings are provided for holding the axis of the cutter head. The cutters are mounted in the cutter head in such a manner as to stand radially upon its outer face. The cutting point of each cutter or tool is made to correspond with the spaces between the threads to be formed. The operation of automatically forming the thread upon the tap is accomplished by a succession or series of cutters, but to produce the desired "relief" or clearance necessary in a perfect tap a secondary movement must be given to the cutters.

A.D. 1872, August 26.—No. 2540.

HENRY, ALEXANDER, of Edinburgh, in the county of Mid Lothian, North Britain.—"Improvements in "breech-loading fire-arms."

The features of novelty which constitute this invention are, certain arrangements of that class of fire-arms, wherein a vertically sliding breech-piece is employed for opening and closing the breech or cartridge chamber, and in which the "cocking" or throwing up into firing position of an elongated tumbler or other form of striker employed for igniting the cap of the cartridge is effected simultaneously with the act of depressing the breech piece, so as to open the breech or cartridge and extract the case of the spent cartridge.

A.D. 1872, August 27.—No. 2550.

HALL, CHARLES HENRY, of New York city, in the state of New York, and in the United States of America.—"Improved steam and water gauge for use with steam boilers and analogous apparatus."

My improved guage provides a reliable means for indicating the pressure of the steam and also the exact height of the water line in the boiler at any desired distance from the boiler and within any moderate height above, or when required at a lower level than the boiler. It is adapted for mounting in the counting rooms of manufactories and in the cabins of steamers; as also for indicating the pressure and height of the fluid in apparatus for distilling oils and various other materials.

A.D. 1872, August 28.—No. 2553.

BONNEVILLE, HENRI ADRIEN, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from John B. Wightman, a person resident at the city of Brooklyn, in the county of Kings, and state of New York, United States of America.*)—"Improvements in the construction of child's carriages or perambulators."

This invention relates to the construction of the body of carriages or perambulators in such manner as will enable said body to be reversed, and thus avoid exposing the child to the sun or rain, and consists in pivoting the said body, so that when desirable the position of the same may be reversed from back to front.

A.D. 1872, August 29.—No. 2572.

LAKE, WILLIAM ROBERT, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Henry Bloodgood, of the city and state of New York, United States of America, merchant.*)—"Improved compounds chiefly designed for coating ships' bottoms."

The compounds which form the subject of this invention are made of the residuum of palm oil or tallow, after distillation, mixed with pulverized slate or sand and asphaltum, or with spirits of turpentine, and to this mixture may also be added linseed oil or other equivalent substance mixed with arsenic and verdigris.

A.D. 1872, August 30.—No. 2578.

ONFFROY, ARMAND HENRY, of the Admiralty, Somerset House, London.—(*A communication from Messrs. Onffroy and Company, of 48, Rue St. Aubin, Angers, Maine-et-Loire, France.*)—"A new description "of steam boiler specially adapted for marine, locomotive, land, and portable engines."

Arched furnace crown.

Connection of water in boiler with water in a central tube, which serves as a fire-bridge, by tubes through the furnace crown into the central water tube.

Furnace front or frame shaped like a mill hopper and raised above the furnace mouth.

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AND TO

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes.]

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  - Hookham, 1938 (*App.* 52.)
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  - Saunders, 278.
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- Neck-ties or cravats:
  - Clark (*Klotz, jun. & Co.*), 47.
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- Needle sheaths and protectors:
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  - Coffey, 64.
  - Young, 413.
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- Packing for steam-engines, pumps, valves, &c.:
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- Pails:
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- Sinks :
  - Gowans, 87.
- Size :
  - Sellars, 393.
- Sizing, dressing and gumming yarns :
  - Lancaster & Bullough, 683 (*App.* 36.)
- Skates :
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- Sketching. *See* "Drawing."
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- Slaughter houses :
  - Norton, 357.
- Smoke prevention; burning and consuming smoke :
  - Kent, 90.
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  - Lake (*Diehl*), 527.
- Snow and ice (melting):
  - Hughes (*Folkmann & Kölgen*), 639.
- Soap :
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- Soda. *See* "Alkalies."
- Sodium, potassium and their salts :
  - Weldon, 359.
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- Sowing seed :
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- Spades and shovels :
  - Jones, 400.
- Spark arresters :
  - Edwards (*Thornton*), 1969 (*App.* 52.)
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  - Vale, 72.
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  - Wilson, 446.
- Spindles; spindles and flyers :
  - Cunningham, 55.
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- Spinning and twisting asbestos or amianthus :
  - Fish, 6.
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- Spinning, twisting, doubling and throwing fibrous materials :
  - Gilmore, 29.
  - Hepworth & Hepworth, 53.
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  - Hughes (*De Labarre*), 191.
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  - Brookes (*Augsburger Kammgarnspinnerei*), 2498 (*App.* 8.)
- Spinning (carding, combing and heckling fibrous materials) :
  - Whitehead, 23.
  - Holden, 44.
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  - Hughes (*De Labarre*), 191.
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- Spinning (opening, ginning and cleaning fibrous materials) :
  - Madden (*Bourne*), 118.
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  - Dobson, Rushton & Dobson, 292.
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- Splints (cutting). *See* "Cutting wood."
- Spray producers :
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  - Newton (*Thompson*), 506.
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- Stamping or shaping articles in metal :
  - Lake (*Shepard & Seaman*), 444.
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- Stamping ores. *See* "Grinding ores."
- Starch :
  - Gibbs & Borwick, 314.
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- Starting machinery; throwing into gear :
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  - Weeks, 141.
- Steam-boiler furnaces. *See* "Furnaces."
- Steam-boilers and generators; generating and superheating steam :
  - Fish, 6.
  - MacDonald & Eskrett, 62.
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  - Lake (*Caumon* (*Absterdam*)), 1135 (*App.* 42.)
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  - Weir & Weir, 262.
- Steam-boilers (water feeding and heating) :
  - Gilbee (*Argall*), 41.
  - Higginson, 202.
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Tanning skins. *See* "Leather."

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Lake (*Biggs*), 1019 (*App.* 40.)

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- Smith (*Michaels & Broadwell*), 477.
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- Quick, Messrs. & Cooper, 593.
- Westinghouse, jun., 595.
- Copeman, 601.
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- Saunders, 644 (*App.* 9.)
- Lyttle, 867 (*App.* 9.)
- Westinghouse, jun., 933 (*App.* 4.)
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- Calahan, 1537 (*App.* 47.)
- Sullivan, 1689 (*App.* 49.)
- Hookham, 1938 (*App.* 52.)
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Sinks:
- Gowans, 87.

Size:
- Sellars, 393.

Sizing, dressing and gumming yarns:
- Lancaster & Bullough, 683 (*App.* 36.)

Skates:
- Pennell, 54.

Sketching. *See* "Drawing."

Skylights. *See* "Windows."

Slaughter houses:
- Norton, 357.

Smoke prevention; burning and consuming smoke:
- Kent, 90.
- Woods, 277.
- Jarman & Mitchell, 338.
- Edwards & Robinson, 475.
- Rice, 520.
- Lake (*Diehl*), 527.

Snow and ice (melting):
- Hughes (*Folkmann & Kölgen*), 639.

Soap:
- Morfit, 140.
- Platt, 969 (*App.* 40.)

Soda. *See* "Alkalies."

Sodium, potassium and their salts:
- Weldon, 359.
- Smith, 425.
- Anderson, 513.
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Sowing seed:
- Harrison, 77.

Spades and shovels:
- Jones, 400.

Spark arresters:
- Edwards (*Thornton*), 1969 (*App.* 52.)

Spectacles; eye protectors:
- Vale, 72.

Spermaceti:
- Wilson, 446.

Spindles; spindles and flyers:
- Cunningham, 55.
- Rowley, 408.
- Porritt, 1107 (*App.* 42.)

Spinning and twisting asbestos or amianthus:
- Fish, 6.
- Fish & Wotherspoon, 7.

Spinning, twisting, doubling and throwing fibrous materials:
- Gilmore, 29.
- Hepworth & Hepworth, 53.
- Worth, 124.
- Oldroyd & Oldroyd, jun., 167.
- Hughes (*De Labarre*), 191.
- Walker, 196.
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- Rowley, 408.
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- Nutting, 1035 (*App.* 41.)
- Bonneville (*Martin*), 1078 (*App.* 41.)
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- Lake (*Sutherland*), 1418 (*App.* 45.)
- Abel (*Dreyscharff*), 2229 (*App.* 4.)
- Brookes (*Augsburger Kammgarnspinnerei*), 2498 (*App.* 8.)

Spinning (carding, combing and heckling fibrous materials):
- Whitehead, 23.
- Holden, 44.
- France, 117.
- Walton, 176.
- Hughes (*De Labarre*), 191.
- Mollady, 234.
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- Smith (*Marée & Varlet*), 442.
- Gardner, 491.
- Mewburn (*Droulers-Vernier*), 511.
- Mills (*Bolette*), 633.
- Lake (*Chase & Platt*), 961 (*App.* 40.)
- Lowry, 1966 (*App.* 52.)

Spinning (opening, ginning and cleaning fibrous materials):
- Madden (*Bourne*), 118.
- Walker (*Sugden*), 166.
- Dobson, Rushton & Dobson, 292.
- Dobson, Rushton & Dobson, 434.
- Richardson, 456.
- Gardner, 491.
- Browne (*Count of Montebello*), 510.
- Rowan, 584.
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- Lake (*Hail*), 717 (*App.* 36.)
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Spinning ropes. *See* "Ropes."

Splints (cutting). *See* "Cutting wood."

Spray producers:
- Ripley (*Depoully*), 283.
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- Vernon, 335.
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Stables; cattle sheds:
- Norton, 357.

Stair treads:
- Norton, 357.

Stamping machines:
- Bayly, 319.
- McDonald, 352.
- Mendel, 380.
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Stamping machines.—*cont.*
- Newton (*Thompson*), 506.
- Johnson (*Reckendorfer*), 578.

Stamping or shaping articles in metal:
- Lake (*Shepard & Seaman*), 444.
- Printz (*Kayser*), 466.

Stamping ores. *See* "Grinding ores."

Starch:
- Gibbs & Borwick, 314.
- Johnson (*Leconte*), 404.

Starting machinery; throwing into gear:
- Bracewell, Riley & Bracewell, 185.
- Smyth, 187.
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Station indicators:
- Lock, 479.

Stays and corsets:
- Gamble, 161.
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Steam-boiler funnels (preventing from scaling):
- Weeks, 141.

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Steam-boilers and generators; generating and superheating steam:
- Fish, 6.
- MacDonald & Eskrett, 62.
- Montgomerie, 79.
- Healey, 85.
- Cooke, 123.
- Friedmann, 254.
- Weir & Weir, 262.
- Johnson, 293.
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- Johnson (*Buzby*), 419.
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- Lake (*Caumon (Absterdam)*), 1135 (*App.* 42.)
- Cazier, 1941 (*App.* 52.)
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Steam-boilers (cleansing and preventing incrustation of):
- Ellis & Dobson, 247.
- Friedmann, 254.
- Calvert & Taylor, 350.
- Gedge (*Welter*), 433.
- Smith, 624.
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Steam-boilers (preventing priming):
- Weir & Weir, 262.

Steam-boilers (water feeding and heating):
- Gilbee (*Argall*), 41.
- Higginson, 202.
- Newton (*Harris*), 308.
- Calvert & Taylor, 350.
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Steam carriages:
- Grantham, 173.
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- Steam chests (preventing from scaling):
  - Weeks, 141.
- Steam-engines (stationary, locomotive and marine):
  - Caspersen (*Blair*), 28.
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- Steam ploughs. *See* "Ploughs."
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- Steam traps:
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- Stearine:
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- Steering and guiding ploughs:
  - Hill, 65.
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  - Lester, jun., 19.
  - Pieper, 153.
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  - Mortlock, 34.
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  - Lake (*Schott*), 279.
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  - Whittingham, 215.
  - Marsden, 649 (*App.* 9.)
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- Stop motions; throwing out of gear:
  - Pieper, 153.
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- Stop motions, &c.—*cont.*
  - Woodman, 2199 (*App.* 4.)
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  - Budenberg (*Priew*), 235.
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- Tanks. *See* "Cisterns."
- Tanning skins. *See* "Leather."
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  - Bonneville (*Charton*), 1079 (*App.* 41.)
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  - Clark (*D'Arlincourt*), 255.
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  - Calahan, 2327 (*App.* 6.)
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  - Highton, 4.
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  - Lyttle, 109.
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  - Clark (*D'Arlincourt*), 255.
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  - Lyttle, 867 (*App.* 9.)
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  - Westinghouse, jun., 595.
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- Theodolites:
  - Lake (*Biggs*), 1019 (*App.* 40.)
- Thermometers:
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- Thief detectors:
  - Calahan, 1537 (*App.* 47.)
- Thrashing and hulling corn, grain and seeds:
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  - Kiloh, 415.
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  - Fish & Wotherspoon, 7.
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  - Browne (*Count of Montebello*), 510.
- Tilting barrels. *See* "Cask tilters."
- Tin and lead foil:
  - Morton, 96.
- Tins (making):
  - Warren, 113.
- Tinting photographs. *See* "Photography."
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  - Edgcumbe & Fitz Maurice, 112.
  - Dee, 127.
  - Dee, 158.
  - Boger, 246.
  - Clark (*De Susini-Ruiseco*), 300.
  - Grafton, 341.
  - Oldroyd, 364.
  - Ward, 486.
  - Culp, 1377 (*App.* 45.)
  - Haseltine (*Tanner*), 2329 (*App.* 6.)
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  - Lake (*Batchelder*), 783 (*App.* 37.)
- Towing boats. *See* "Propelling ships."
- Track clearers for tramways or railways:
  - Minns, 627.
- Traction engines:
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This Index is published on Friday in each week, and is forwarded, post free, to Subscribers. Terms 26*s.* per annum. Subscriptions received at the Sale Room of the Patent Office, where also single copies may be obtained at 4*d.* each, except the concluding number (containing the complete Indexes of Names and Subject-matter for the year), the price of which is 2*s.* Post Office Orders to be made payable at the Post Office, Holborn, to Mr. Bennet Woodcroft, Clerk to the Commissioners of Patents.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
Published at the Office of the Commissioners of Patents,
25, Southampton Buildings, Holborn
Friday, September 6, 1872.